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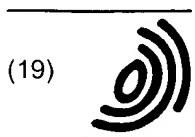
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(54) Method and system for composite site resource generation

(57) Disclosed are computer-implemented methods and systems for generating composite resources of a web site. A request including an identifier of a composite site is received and the identifier used to retrieve a characterization of the composite site. The characterization includes identifiers of component resources that make up the composite site resource as well as the layout in which the components should be assembled to form the composite site resource. Upon identifying the components, this information is passed to a client system that retrieves the component resources, e.g., from across a network. The retrieved components are assembled into the composite site resource at the server side, of a cli-

ent-server interaction with the end-user. The composite site resource is provided to the end user's client system. An additionally disclosed aspect is where the composite site resources includes an HTML frameset. A further disclosed feature is cooperation between an application for managing generation of composite site resources and a transaction engine through which the end-user browses composite site resources, and which monitors end-user browsing session events. As an additional aspect, the decoupling of composite site generation management from the functionality of the transaction engine allows for each component to be optimized and an overall system deployed in a more scalable and easily distributable manner.

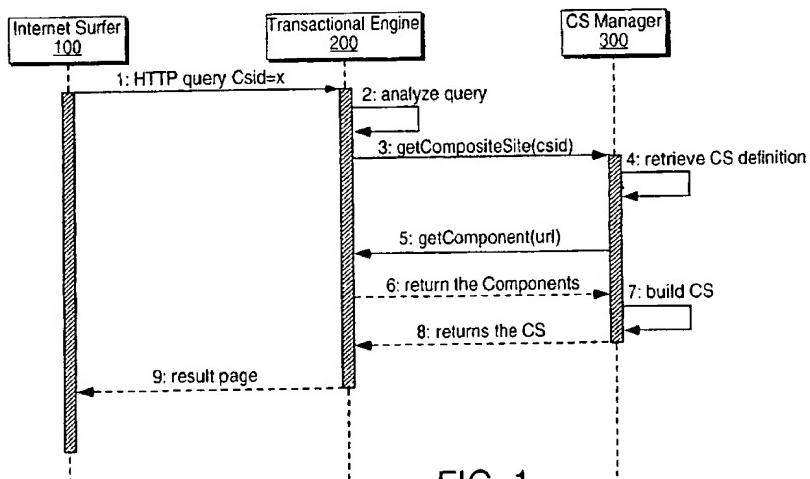


FIG. 1

Description**FIELD**

5 [0001] Features of the invention relate generally to systems for server-side generation of resources in client-server computing and, more particularly, system architectures for generating composite web site resources.

BACKGROUND

10 [0002] With the recent proliferation of electronic commerce systems, a need has arisen for systems providing a convenient and efficient means for automation and management of business relationships between electronic commerce trading partners.

[0003] One desirable functionality, particularly in the context of such systems, is the ability for electronic commerce trading partners to provide prospective customers a set of on-line resources that reflects the particular relationship 15 between the electronic commerce trading partners. For instance, if a merchant with an on-line catalog, partners with several affiliates, the merchant may desire to provide collections of on-line resources to prospective customers that are unique for each affiliate. This will frequently also be desirable for the affiliates, as well. Given its current ubiquity, a world wide web site is a conventional and important platform for providing such collections.

[0004] Frequently it is desirable to provide collections of resources that include resources from the web trading partners. Frequently, the web trading partners have invested considerable time and money in developing their own site content and having to recreate content in the context of a partner relationship is inefficient and costly. Keeping with the above example, the merchant with its on-line catalog at its website and the affiliate with its own content, desire to present a collection of resources which are a composite of the merchant's catalog pages and the affiliate's content (possibly with other resources as well). Thus, a solution is needed that provides a means to integrate resources from 20 distinct, arbitrarily located and/or arbitrarily chosen, resource collections to provide a composite resource. It is further desirable for such a means to be amenable to rapid setup to facilitate deployment of collections of composite resources unique to a particular web trading partnership.

[0005] With some conventional solutions, set-up of these unique collections can be exceptionally burdensome. In a worst case, in order to provide a composite collection of resources, the collection would have to be specifically-created 30 in a one-off manner. Some conventional solutions do exist which can achieve greater efficiencies than this, however, conventional solutions are still lacking.

[0006] One type of related conventional system involves server-side logic that executes to dynamically create resources. Sun Microsystems' JAVA Server Pages and servlets is one example, as is the PHP environment, as are older 35 CGI-based scripts or program. Such systems typically involve the server-side execution of code for the generation of all or a portion of the resource. In such environments, the resource is local to server system, although it may be dynamically generated. An additional feature that can be incorporated with such systems is database connectivity. This allows for results of database queries to be incorporated within resources. These conventional systems do not provide an effective means for incorporating (possibly dynamic) resources maintained on remote hosts, e.g., the merchant and the affiliate, to form a composite resources. Even with database connectivity, such conventional systems still suffer 40 from a database update problem, namely that hosts possibly contributing resources to be used in a composite resource would have to update a central database storing all such possibly-contributing component resources whenever the component resource was altered. Thus there is a need in the art, for a system to exist that provides an effective means to incorporate arbitrarily-chosen and arbitrarily located component resources.

[0007] Another conventional solution overcomes some of the problems noted above, but creates others. This solution 45 involves having a monolithic software architecture that is responsible both for managing the relationship among the web trading partners and also generating composite resources. Such a system, however, has performance inefficiencies. First, the portion of the application which generates composite resources can impair performance of the system overall. Second, with a monolithic architecture, distribution of the application becomes hampered. It may be desirable, particularly in high-transaction-volume environments, to distribute portions of the application across several operating 50 environments. For instance, a first portion responsible for tracking user interaction and generating event data could be implemented under a different operating system than a second portion responsible for generation of composite resources, depending on the relative strengths of the operating system, e.g., threading package, memory management, security model, etc.

[0008] Accordingly, there is a need for methods and systems that conveniently and efficiently generate composite 55 resources including arbitrarily chosen/ arbitrarily located component resources, and further assemble the component resources in accordance with a layout particular to a partner relationship. Still further there is a need for such a means to be decoupled from other application logic to facilitate distributed processing and application modularity.

SUMMARY

[0009] Particular and preferred aspects of the invention are set out in the accompanying independent and dependent claims. Features of the dependent claims may be combined with those of the independent claims as appropriate and in combinations other than those explicitly set out in the claims.

[0010] The present invention provides a solution to these and other problems with a method and system for generation of composite site resources. One aspect of the present invention provides computer-controlled methods for generating a composite site resource. An illustrative method includes receiving an identifier of a composite site and retrieving a characterization of the composite site resource responsive to the identifier. The characterization includes a set identifiers for a set of component resources. The method also includes communicating requests to retrieve the set of component resources based on the set of identifiers and receiving the set of component resources. Then, the component resources are assembled in accordance with the characterization for creating the composite site resource. The composite site resource is returned to a requesting system.

[0011] In a variation on this method, assembling the resource includes assembling a frameset. The component resources include identifiers of resources of frames of the frameset. This variation also includes receiving requests for the resources of frames of the frameset, retrieving the resources of frames of the frameset; and returning the resources of frames of the frameset.

[0012] In another feature, retrieving a characterization of the composite site resource includes submitting a query to a relational database for the characterization; and transforming results from the query from a relational data model to an XML schema.

[0013] The characterization of the composite site resource can be static or dynamic. In a further feature, the characterization of the composite site resource is associated with a relationship between a first peer entity and a second peer entity. The characterization of the composite site resource is predetermined by one of the first or second peer entities. In this variation, providing requests for the component resources includes providing a first request for a first component resource to a first sever system associated with the first peer entity, providing a second request for a second component resource to a second sever system associated with the second peer entity.

[0014] Yet another illustrative method includes receiving a request for a composite site resource, the request comprising an identifier of a composite site, and requesting a characterization the composite site associated with the identifier. Next, in this method, identifiers of component resources of the composite site resource are received and, the component resources requested based upon the identifiers. This method then includes receiving and returning the component resources, receiving the composite site resource; and providing the composite site resource.

[0015] Yet another illustrative method includes receiving a request for a resource from a first client system. The request is received with a first server application and includes an identifier of a composite site. The request is for a composite site resource. The first server system extracts the identifier of the composite site. A message including the identifier of the composite site is communicated to a second server application for requesting the composite site resource. The second server application retrieves a characterization of the composite site resource based on the identifier of the composite site. Component resources from the characterization of the composite site resource are identified and provided to a second client a system. The second client requests the component resources and returns the component resources to the second server application. The second server application assembles the component resources in accordance with the characterization of the composite site for creating the resource associated with the composite site. The composite site resource is returned to the first server application; and the first server application returns the composite resource to the first the first client system.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The above and other features, aspects, and advantages of the present invention will become better understood with reference to the following description and accompanying drawings of illustrative embodiments, and appended claims, where:

Fig. 1 depicts a flow diagram showing high-level process flow in a composite site resource generation system with tabular layout;

Fig. 2 depicts a flow diagram showing high-level process flow in a composite site resource generation system with frameset layout;

Fig. 3-1 depicts an HTML table-based composite site definition;

Fig. 3-2 depicts an HTML frame-based composite site definition;

Fig. 4 depicts a composite site schema;

Fig. 5 depicts a flow diagram of the generation of an HTML-table based composite site showing schema references;

5 Fig. 6 depicts a flow diagram of the generation of an HTML-frame based composite site showing schema references; and

Fig. 7 depicts a process separation in connection with composite site generation.

10 **DETAILED DESCRIPTION**

OPERATING ENVIRONMENT

15 [0017] In some embodiments, features of the present invention operate in an architecture for administering and managing network-based partner relationship. Such a system is described in the concurrently-filed application entitled "Method and System for Managing Network-based Partner Relationships," attached hereto as **ANNEX A**. In such an architecture, the present invention provides an improved system and method for generating a collection of composite resources (a "Composite Site"). In this context, an end-user interacts with a Composite Site reflecting a particular network-based partner relationship. In an illustrative embodiment, a transactional engine is used for tracking the browsing session of a user to monitor activity in the context of the partner relationship. The resources provided to the client system of the user in the browsing session are composite site resources generated in accordance with the present invention. In another aspect of this embodiment, a characterization of the composite site resources is generated in the connection with establishing the network-based partner relationship.

25 ***DESCRIPTION OF FIGURES***

[0018] Fig. 1 depicts a high-level flow diagram of an illustrative embodiment of a composite site resource generation system for generation of a composite site with an HTML table layout. Process flow initiates where a user operating a client system "internet surfer 100" provides a request 1 comprising an identifier of a composite site ("csid"). The internet surfer 100 operates client software executing on computing machinery to initiate the request 1 as is known in the art. No particular hardware/software combination is fundamental. Rather, any suitable computing platform, including, for instance, a mobile device, set-top box, internet appliance, or general purpose computer could be used.

[0019] A transactional engine 200 receives the request 1. The transactional engine 200 preferably is a collection of software modules executing on a general purpose computer. The transactional engine 200 performs functions including tracking the browsing session of the internet surfer 100 in connection with a system for managing network-based business relationships. **ANNEX A** of the present disclosure is a concurrently filed patent application illustrates such a system. One skilled in the art will appreciate that features of the present invention are not limited to co-operation with features in system in the above-mentioned patent application. The opposite is true.

[0020] The request 1 includes an identifier of a composite site. The transactional engine 200 analyses 2 the request 1. This involves parsing the request 1 and extracting the identifier of the composite site. In some embodiments, the request is an HTTP Request Message, and the identifier of the composite site is passed in the path portion of a URL. Other techniques available to one skilled in the art could also be used. Next, the transactional engine 200 invokes a method 3 in a composite site manager 300 (sometimes abbreviated CSManger) to retrieve a composite site definition associated with the composite site identifier.

[0021] The composite site manager 300 comprises software modules for generating composite site resources. Of note is that, architecturally, the CSManger 300 is completely decoupled from the transactional engine 200. This decoupling allows optimization of the transactional tracking features of the transactional engine 200 and the composite site generation features of the CSManger 300. In some embodiments the transactional engine 200 is implemented in a language such as C for relatively high efficiency and the CSManger 300 is implemented in JAVA or other higher level language with increased internetworking functionality. Still further, in embodiments which operate in the context of managing network partner relationships, decoupling of the CSManger 300 from the transactional engine 200 allows those aspects of the logic of the relationship reflected in the composite site to be separated from the transactional engine 200. This increases scalability of both the CSManger 300 and the transactional engine 200 and facilitates their deployment in a distributed environment. For instance, the CSManger 300 could, in this way, be deployed on a machine remotely disposed from the machine executing the transactional engine 200 (with communication across a network).

[0022] The CSManger 200 retrieves 4 a definition of the composite site from storage (not shown). The composite site definition is described in greater detail below in connection with **Fig. 3-1** and **Fig. 3-2**. Briefly here, the composite

site definition comprises identifiers of component resources and other structural information for the composite site resource. In some embodiments, presentation information could also be included. The CSManager 300 extracts the identifiers and provides a component request 5 to the transactional engine 200. The transactional engine retrieves the component resources and responds 6 to the component request 5 with the component resource. In some embodiments, the transactional engine 200 performs transformative processing on the component resource before responding. The component request-response cycle may be repeated depending on the number of component resources needed to build the composite site resource.

[0023] When the CSManager 300 has received the needed component resources, the CSManager 300 builds 7 the composite site resource and returns 8 the composite site resource to the transactional engine 200. The transactional engine 200 then provides a response 9 to the request 1 of the internet surfer 100. In some embodiments, the transactional engine 200 performs transformative processing on composite site resource before providing the response 9 to the internet surfer 100.

[0024] Fig. 2 depicts a high level flow diagram of an illustrative embodiment of a composite site generation system for generation of a composite site resource with an HTML frame layout. The process flow differs from that described above in connection with Fig. 1 in that the client system of the internet surfer 100 first receives a frameset and thereafter the component resources associated with each of the frames in the frameset.

[0025] Process flow up through where the CSManager 300 retrieves 4 the definition of the composite site is similar to that discussed in connection with Fig. 1. However, in this instance the composite site definition includes a frameset as is further described below in connection with Fig. 3-2. The composite site definition includes identifiers of component resources. However in this instance, the component resources may themselves be references to other component resources. For instance, in some embodiments a frameset component resource includes a URL to a document. The CSManager 300 initiates a request 15 for the component resource from the composite site definition. The transactional engine 200 returns 16 the URL to the component resource say, a document, as well as the document itself. In some embodiments the URL is rewritten to facilitate tracking of the user's browsing session as is described in greater detail in the above-mentioned disclosure set forth as **ANNEX A**. In some embodiments, the CSManager 300 conveniently caches the component resource to speed retrieval. The above-described request - response cycle is repeated for the component resources identified in the composite site definition. When this completes, the CSManager 300 builds the composite site frameset 17 by appropriately incorporating the URLs into the composite site definition and provides 18 the composite site to the transactional engine 200.

[0026] The transactional engine 200 returns 19 the composite site resource, in this instance the frameset, to the internet surfer 100. The client system of the internet surfer 100 proceeds conventionally to submit request 20 to the locations of the URLs in the frame set for the associated component resources. The transactional engine 200 provides a request 21 to the CSManager 300 for the component resource; the CSManager 300 builds 22 the component resource, preferably retrieving it from a cache, and returns 23 the component resource to the transactional engine 300. The transactional engine 200 then provides 24 the component resource to the internet surfer 100.

[0027] In accordance with an illustrative embodiment used in connection with managing a network-based business relationship, the characterization of composite site resource is associated with a relationship between a first peer entity and a second peer entity. The characterization of the composite site resource is predetermined by either the first or second peer entities, or they both could participate in establishing the characterization. Component resources could be requested from server systems operated by both the first and second peer entities when creating the composite site resource.

[0028] Fig. 3-1 depicts an HTML table-based composite site definition 3000 in accordance with an illustrative embodiment. The HTML table-based composite site definition 3000 includes a first component resource identifier 3100 and a second component resource identifier 3200. The particular syntax or number of component resource identifiers is not fundamental and may vary. Layout techniques are not limited to HTML tables or framesets. In other embodiments, layout elements in cascading style sheets or style languages could be used. More generally, layout techniques available to one skilled in the art and able to be parsed and rendered by the client system of the internet surfer 100 could be used.

[0029] Fig. 3-2 depicts an HTML frame-based composite site definition 3500 in accordance with an illustrative embodiment. The HTML frame-based composite site definition 3500 includes a third component resource identifier 3250, a fourth component resource identifier 3300, and a fifth component resource identifier 3400 (as well as others not specifically referenced). The particular syntax or number of component resource identifiers is not fundamental and may vary. As noted above, in the case of the HTML frame-based composite site definition 3500, component resource identifiers could be replaced by the CSManager 300 with URLs and the browser application of the internet surfer 100 subsequently request the resources associated with the URLs.

[0030] Fig. 4 depicts a composite site schema 4000 in accordance with an illustrative embodiment. A 'CSManager' class 4100 is the main class of the CSManager 300. The 'CSManager' class 4100 initializes the CSManager and creates a thread for a server manager handling requests from the transactional engine 200. A 'CSBuilder' class 4100 performs the function of building the composite site and is decoupled from the communication between the CSManager

300 and the transactional engine 200. A 'CSFactory' class 4150 creates a new instance of a 'CompositeSite' class 4200 when needed.

5 [0031] The 'CompositeSite' class 4200 represents the composite site definition. In some embodiments, the presentation of the composite site is in HTML, in others it could be in XML and have an accompanying style sheet; in still others it could be a markup language for use with wireless devices, and still other formats could be used.

10 [0032] A composite site resource can have more than one representation; there is no representation definition in the 'CompositeSite' class 4200. A 'Page' class 4300 defines the representation of the composite site. There is a link to the 'Page' class 4300 from the 'CompositeSite' class 4200. There could be different types of the 'Page' class 4300. In some embodiments, there is only an 'HTMLPage' subclass 4350. The 'HTMLPage' subclass 4350 is a specialization of the 'Page' class 4300 and represents the page associated with a composite site in an HTML format. The build method of this subclass is responsible for building the composite site with an HTML representation.

15 [0033] An abstract 'Layout' class 4400 provides an association between the different component resources of the composite site and their situation in a page. A 'FormatConstraint' class 4450 is associated with the 'Layout' class 4400. The 'FormatConstraint' class 4450 represents constraints for a format associated with a Layout. Format constraints for an HTML representation may include, for instance, a FrameBorder, a Scrolling property, a Background Color, a Resizability property, and a Splitability property. To one Layout different FormatConstraint' classes 4450 could be associated depending on the desired format.

20 [0034] In some embodiments, an 'IComponent' class (not shown) represents common attributes and/or behaviors common to plural component resources. Subclasses having a component resource as their content can then inherit and extend this class. The content of a component resources may have plural representations. The representations may be context dependent and/or format dependent. Preferably, only a single external reference is used to access a component resource, irrespective of representation.

25 [0035] In some embodiments, common attributes include a component resource type, a component resource content, and a component resource external reference. An illustrative embodiment has four primary component resource types: an HTML document, an image, a clickable image—namely a hypertext link for which an image is the anchor—and text.

30 [0036] A 'Component' class 4500 is a super class of the component resources. The 'Component' class 4500 includes an association to a 'Locator' object 4550. For a static component resource, the location could correspond to the URL; for a dynamic component resource the location of the component could be variable. To the 'Locator' object 4550, an extraction rule could be associated. This rule determines the location of the component as function of a set of parameters.

35 [0037] A 'Container' class 4600 contains a set of component resources and has an associated 'Grouping Rule' object 4625 and 'Selection Rule' object 4650. These are for the suggested functions, grouping and selecting among the component resources, respectively.

40 [0038] Fig. 5 depicts a flow diagram of the generation of an HTML-table based composite site showing schema references in accordance with an illustrative embodiment. Process flow initiates in a ServerManager thread 5100 that invokes a getCompositeSite method 51 in a CSManager object 5200. The CSManager object 5200 invokes a getCompositeSite method 52 in a CFactory object 5300 that takes as its argument an identifier of the composite site for generation. A new Composite Site object 5400 is returned 53 and its build method 54 invoked. Next, a build method 55 is invoked in a Page object 5500 which, in turn, invokes a getData method 56 is an associated component object 5600.

45 [0039] Assuming the component resource is a document with associated URL, a GetComponent message 57 is passed to a client manager 5800 in the transactional engine 200 that fetches and returns the fetched document 59. An analyzeDocument method 59 executes for parsing the document and the getData method 56 completes with the document data returned 60 to the Page object 5500.

50 [0040] The 'Page' object 5500 invokes a getConstraint method 61 in a Layout object 5700 in completing execution of the build method 55. When execution completes the page is returned 62 to the Composite Site instance 5400 that returns the results 63 to the CSManager 5200 that in turn provides the results to the ServerManager thread 5100.

55 [0041] Fig. 6 depicts a flow diagram of the generation of an HTML-frame based composite site showing schema references in accordance with an illustrative embodiment. Process flow initiates in a ServerManager 6050 that receives a message from the transactional engine 200 for building the composite site. A 'getCompositeSite' message 71 is sent to a CSManager object 6100 that invokes a getCompositeSite method 72 in a CSFactory object 6150 and provides an identifier of the composite site for creation. (Note that, function differences are not implied by different a reference numeral for the CSManager from that in Fig. 1 only clarification when reference is being made in the context of the schema). The CSFactory object 6150 returns 73 a new Composite Site instance 6200 and the CSManager object 6100 invokes a build method 74 in the new Composite Site instance 6200. A build method 75 is invoked in a page object 6300 that, in turn, invokes a getURL method 76 in a component object 6500 to retrieve the URL (component resource) associated with the page being assembled. The URL is passed along with a parseURL message 77 to a client manager 6600 in the transactional engine 200 that returns 78 the parsed URL 78 and execution of the getURL method 76 completes. The page object 6300 retrieves layout constraints 80 from a layout object 6400 and the builds the composite

site page 81 accordingly.

[0042] Execution of build method 75 the CompositeSite object 6200 invoked completes and the composite site page is returned 82 and is routed back (steps 83 and 84) to the browser of the internet surfer 100.

[0043] As Fig. 6 depicts the situation of a frameset, the browser application conventionally submits requests for the resources associated with each frame of the frameset from the transactional engine 200. The transactional engine 200 provides messages to the CSManger object 6100 to request the component resources. A getComponent method 85 taking an identifier of the composite site, an identifier of the component resource, and a type of the component resource is invoked in the CSManger object 6100. The CSManger object 6100, in turn, invokes a getComponent method 86 in the new Composite Site instance 6200.

[0044] Next, a build method 87 in the page object 6300 invokes a getData method 88 in the component object 6500 to request the component resource data. Assuming for illustration, the component resource is an HTML document, a getComponent message 89 is sent to the client manager 6600 of the transactional engine 200 to retrieve the component resource associated with the particular URL. The transactional engine 200 returns 90 the HTML document component resource and the getData method 88 completes. The page object 6300 parses the component resource 92 retrieves any layout constraints 93 and assembles the composite site page 94. The page is returned. The build method 87 completes and the component resource continues back to the browser of the internet surfer 100 (in steps 95, 96, and 97).

[0045] Fig. 7 depicts a process separation in connection with composite site generation. As noted above, yet another characteristic feature of the present invention lies is the fact that creation of composite site resources can be decoupled from applications and/or services which use the composite site resources. These aspects are illustrated in Fig. 7 with reference to an illustrative embodiment in which the transactional engine 200 uses the CSManger 300 for the creation of composite site resources.

[0046] Process flow initiates when a transactional engine management module 7200 receives a request to provide a composite site resource. The management module 7200 provides a message 7010 to a document construction module 7300. The document construction module 7300 sends a message 7020 to a communication client 7700 to get the composite site resource.

[0047] The communication client 7700 communicates the request to get the composite site resource to the CSManger 300 through a sockets layer. The CSManger 300 executes as has been previously described and submits a request 7030 for component resource 7040 of the composite site. The communication client 7700 provides the request for the component resource 7040 to a mkdocs module that instructs a client application 7500 to get the requested resource 7060. The client application 7500 returns 7070 the requested resource.

[0048] If the document should be parsed, a parsing manager 7600 may receive 7080 the document and return a structure 7090 containing the parsed document. The component resource returns 7100 to the communication client 7700 that provides 7110 the component to the CSManger 300. The CSManger builds 7120 the composite site resource as has been described above, and returns 7130 the composite site resource to the transactional engine 200.

[0049] It will be apparent from the foregoing that the CSManger 300 is decoupled from the transactional engine 200. These two software components exchange information but do not depend on each other for their internal operations. When the transactional engine 200 performs functions of monitoring and tracking the browsing session of a user as the user browses composite site resources, decoupling of the CSManger 300 provides substantial benefits. At the simplest level, the CSManger 300 can be implemented on a dedicated system for improved efficiency, security, or scalability. In addition, this decoupling allows the transactional engine 200 to be optimized for tracking the browsing session.

[0050] Although the present invention has been described in terms of features illustrative embodiments, one skilled in the art will understand that various modifications and alterations may be made without departing from the scope of the invention. Accordingly, the scope of the invention is not to be limited to the particular embodiments discussed herein, but should be defined only by the allowed claims and equivalents thereof.

ANNEX A

5

REFERRED TO IN THE APPLICATION

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ENTITLED

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"METHOD AND SYSTEM FOR COMPOSITE
SITE RESOURCE GENERATION"

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**A METHOD AND SYSTEM FOR MANAGING NETWORK-BASED PARTNER
RELATIONSHIPS**

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FIELD

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Features of the invention relate generally to computer-implemented systems for the setup and management of commercial relationships in a network-based environment, and more particularly to systems achieving improved deployment, flexibility and scalability.

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BACKGROUND

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Increasingly, businesses are conducting their operations over public computer networks, most prominently the worldwide web aspect of the internet. These open networks provide profitable opportunities for groups of entities to form partnerships. Indeed, the enormous scope and variety of electronic commerce alliances formed in recent years among trading partners using the worldwide web bears witness to the desirability of such alliances. Both from the perspective of consumers, who are better able to find goods and services of interest, and from the perspective of sellers who are better able to expand their market through alliances, successful implementation 30 of network-based partnering relationships is highly desirable.

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However, software solutions for implementing such relationships leave deficiencies in effective implementation and management of network-based partnering relationships. One common example is the situation where a merchant selling goods through an on-line catalog desires to establish an affiliate network to drive traffic to the merchant site. In exchange for driving a purchaser to the merchant site, the affiliate could receive compensation, say a 40 commission of purchases.

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From the perspective of the merchant, establishing the mechanisms on their site to track affiliate-generated traffic, and provide compensation can be costly and time consuming, and may involve significant intrusive re-editing of their on-line catalog. From the perspective of the affiliate, there is an information deficiency: what is the real value of the traffic being driven to

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5 the merchant and how can the compensation reflect this value. Still further, from the perspective
of the merchant-affiliate partnership it would be desirable for a solution to exist that allowed for
co-marketing, for instance with co-branding, so that both partners could reap the benefits of the
partnership. Accordingly, there is a need for system that allows merchants to conveniently
10 implement an affiliate network, that provides robust information generation, and a convenient
capability of providing partnership-specific content presentations.

15 Another common example is for a portal-type site. A portal-operator typically drives
traffic to many merchants without having a means to capture this value. Indeed, a portal operator
may desire to not completely drive user-traffic to merchant sites when a purchase is to be made,
20 but rather, have the purchase made via the portal site thereby keeping the user. Many portals
have high traffic rates and, in such a situation, effective scalability is highly desirable. Still
further, from the perspective of the portal-operator it would be desirable for a solution to exist
25 that allowed features such as a common shopping basket or common wallet to exist for all or
selected merchants accessible through the portal. Thus it would be desirable for methods to exist
that allowed for a portal-operator to implement a purchasing system that allowed it to manage
30 purchases made on merchant sites by users coming to the merchant through the operator's portal.
Still further, it there is a need for such methods to be highly scalable, flexible, and extensible to
enable the portal-operator to coordinate with the various purchasing systems of the merchants.

35 Yet another common network-based partnership scenario is for a reseller network. A
manufacture with a well-known brand, may wish to direct user-traffic to a local reseller for
40 purchase, follow-up service, localization, special promotions etc. However, simply redirecting
users to the local reseller deprives the manufacturer of information about the efficacy of its
reseller or distribution network. There is a need for a software system to exist that allows for
45 manufacturer in this situation to track information after the user has been directed to their local
reseller. Still further, the entire reseller network could benefit from traffic, sales, and other
information about all members of the reseller network. Thus there is a need for an efficient
50 information dissemination mechanism in connection with network-based partnering
relationships.

There are conventional systems which provide benefits in connection with network-based partnering relationships, but leave several deficiencies. One related means are OLAP and other data mining tools. These tools allow web-site operators to examine and analyze their server logs and from this gain certain forms of information. However, such tools do not assist in implementing a network-based partnering relationship in the first instance, only in gathering data after implementation. Still further, such tools do not provide real-time or near-real-time data but rather are typically based on batch runs through voluminous server logs. This type of delay is undesirable in a rapidly-moving market where commissions could be calculated daily. More fundamentally, this low-level information is not useful in the context of the network-based partnering relationship and must be mapped to the higher-level semantic of the business relationship.

Another related conventional technique are server-side dynamic web page generation tools, e.g. Active Server Pages, Java Server Pages, PHP, or conventional CGI-based scripts/programs. These systems do provide for a general means to dynamically create web pages, however do not provide a convenient and open means to establish commercial partnerships, let along effectively track events that occur in the context of those partnerships. Still further, they provide no effective means to disseminate information to several peer entities in a network-based partner relationship.

Yet another set of related solutions are so-called "link-sharing" or associates-linking systems. These systems typically provide software for administering an affiliate relationship. They frequently require substantial deployment time and effort, with both the merchant and affiliates having to modify their sites. Further, typical solutions of this type are limited to the connecting link between the merchant and the affiliate and are an inadequate solution to gain full tracking information of the user's browsing session in the context of the partner relationship. To gain this type of information in the context of using such tools typically requires reversion to server-log or other data-mining techniques which, as noted above, scale poorly and do not provide real-time data.

Accordingly, there is a need for a methods and systems for implementing and managing

5 network-based partnering relationships that is convenient to deploy, highly scalable, provides for comprehensive real-time information gathering, generation of higher-level semantic information, and efficient dissemination of information.

10 **SUMMARY**

15 Particular and preferred aspects of the invention are set out in the accompanying independent and dependent claims. Features of the dependent claims may be combined with those of the independent claims as appropriate and in combinations other than those explicitly set out in the claims.

20 These and other benefits are obtained by the present invention that provides methods and systems for managing network-based partner relationships. One aspect of the invention provides a computer-controlled method of operating a network-based partner relationship. An illustrative 25 method includes establishing a representation of a relationship between two peer entities. The representation includes collection of resources associated with the relationship, and a presentation template to be applied when providing the collection of resources. The 30 representation also includes criteria for providing a compensation flow between the two peer entities. An additional part of the illustrative method includes dynamically generating composite 35 resources during a browsing session. The composite resources include first and second components selected from the collection of resources associated with the first and second peer entities. This method also includes monitoring the browsing session for generating session 40 events and transforming the session events to events in a semantic associated with the relationship; thus generating higher-level semantic events. Then, a compensation flow is generated based on the higher-level semantic events based on the criteria in the relationship 45 representation.

50 In a variation of this illustrative method, generating session events also includes providing the session events on a first message broker, such as Java Messaging Services, then transforming the session events includes receiving the session events from the message broker and providing the higher-level semantic events on a second message broker. An additional

5 aspect in this variation is where dynamically generating composite resources during a browsing session comprises includes receiving the higher-level semantic events from the second message broker and selecting one or more of the components based on the higher-level semantic events.

10 In yet another variation, dynamically generating composite resources during a browsing session may include initiating a request for a component resident on target site, receiving and altering the request, and then forwarding the altered request to the target site. In an additional 15 aspect, information may be extracted from the request, for instance for implementing a common shopping basket or common wallet. Then, the extracted information could be used to suitably update the data implementing the common wallet/shopping basket.

20 In a related variation, dynamically generating composite resources during a browsing session includes initiating a request for a component resident at a target site, receiving and altering a response from the target site, and forwarding the altered response.

25 Yet another aspect of the invention are computer controlled network based partnership systems. An illustrative system includes a relationship engine for defining attributes of a relationship among at least two peer entities and a storage for storing the attributes of the 30 relationship. The illustrative system also includes a composite site manager for dynamically generating composite resources during browsing sessions. The composite resources include component resources associated with each of the two peer entities and the composite site 35 manager is configured for retrieving a characterization of the composite resources from the storage. This system also includes a session tracking component. The session tracking component includes a server application for receiving requests from a client system, a 40 communication client configured for requesting the composite resources from the composite site manager, a client application configured to request the component resources from server systems associated with the two peer entities and a session event generation module configured for 45 generating event data respecting the requests and the component resources. This system also includes a set of semantic mapping modules that are configured for receiving the event data. The semantic mapping modules include rules for generating higher-level semantic events based on 50 the event data.

A variation of illustrative system just described also includes a message broker. The
5 message broker is configured for receiving the higher-level semantic events from the set of
semantic mapping modules and the composite site manager is further configured for receiving
the higher level semantic events from the message broker. In this variation, the composite site
10 manager dynamically generates the composite resources responsive to the higher-level semantic
events.

Another variation also includes an interposition module logically positioned between the
15 client application and the server systems. The interposition module is configured for altering the
request sent by said client application for the component resources.

In a related variation, the illustrative system also includes an interposition module
20 logically positioned between the client application and the server systems. The interposition
module is configured for altering the component resources sent by the server systems.

To introduce features of the invention more fully set forth below, a summary of an
25 illustrative embodiment will now be described. A web-based merchant seeks to establish an
affiliate network. The merchant deploys a software package embodying features of the invention
30 on a computer system (the "platform"). To attract affiliates the merchant uses a web-based
interface to set up a proposal for potential affiliates (an "offer"). The offer includes a template of
35 a "composite site" that will be used to present co-branded pages to users browsing the merchant's
catalog via the affiliate's site. The offer also includes portions of the merchant's catalog coming
under the scope of the offer, as well as compensation rules, for instance, a commission rate based
40 on sales volume. The merchant makes the offer publicly available on the worldwide web.
Interested potential affiliates review the offer and indicate interest. For those the merchant
45 accepts, a partner relationship is thus established and the platform provides the affiliate with a
link to place on their site with an identifier of the composite site. When user follows this link
they are directed to the platform system. The platform dynamically generates pages based on the
50 composite site definition. The composite site pages include components from the merchant's
catalogs as well as brand images and documents from both the merchant and affiliate. When the
platform retrieves these components it rewrites links in the components to point back to the

platform. Thus, the platform acts as a mobile proxy through which the user's browsing session is controlled. The platform tracks the browsing session and generates event data from the session including, for instance, when the user purchases an item from the merchant's catalog. This event data is passed to a series of modules that take this low session-level data, aggregate it, and generate facts in a semantic of a higher level—the level of the business relationship between the merchant and affiliate. These higher level events are provided on a flexible messaging architecture so that, not only the partners can effectively track their relationship, but also that this information can be provided to other affiliates in a flexible and scalable manner. The platform also tracks these higher-level events and computes commissions due based on the purchases. The merchant and/or affiliate can then access a web site for monitoring the details of their partnership, e.g., commission earned or other statistics.

BRIEF DESCRIPTION OF THE DRAWINGS

- The above features and advantages will be better appreciated with reference to the following detailed description and identified figures where, in accordance with illustrative embodiments:
- Fig. 1 illustrates features of a system for managing networked partner relationships;
- Fig. 2-1, 2-2, and 2-3 depict functions available to various peer entity relationship participants;
- Fig. 3 depicts a state diagram illustrating a composite site browsing session;
- Fig. 4 depicts schematic of a composite site page as it could be parsed and rendered on a user's browser; and
- Fig. 5 depicts a block diagram of a reference rewriting module.

DETAILED DESCRIPTION5 **DESCRIPTION OF FIGURES**

Fig. 1 illustrates features of a system for managing networked partner relationships 1000 in accordance with an illustrative embodiment. A client system 1010, under control of a user, 10 initiates a request (1) across a network 1020 to a host computer system executing software implementing the system 1000 indicated in Fig. 1 as a platform 1040.

15 In some embodiments, the client system 1010 is a conventional "web" browser, configured for operation with either HTML and/or XML executing on general purpose computer. In other embodiments, the client system 1010 could be special-purpose computing hardware, 20 including, for instance, a mobile phone, personal digital assistant, or set-top box. Given its current commercial ubiquity, in preferred embodiments, the network 1020 includes a portion of the Internet; however this is not fundamental and other networks, either public or private, and 25 using either the TCP/IP stack of protocols or other protocols could be used.

A server application 1050 receives the request from the client system 1010. The request preferably includes a plurality of field/value pairs: an identifier of a "composite site" (csid), a session identifier (sid), a customer identifier (cid), a merchant identifier (mid), a partner id (rid), an encoded HTTP referer, and a target frame in which to load the response. These particular fields are not fundamental. In some embodiments, the field/value pairs are part of the path or 30 data portion of a URL, in others they could be passed by cookies, hidden fields, or other means of client-server data transfer available to one skilled in the art. The server application 1050 parses 35 and extracts the field values from the request and passes events (2a) from the user's browsing session to a tracker module 1060. The tracker module 1060 is explained in greater detail below 40 in connection with Fig. 4; briefly, here, certain events from the user's browsing session are tracked for use in generating higher-level semantic events. In the illustrative embodiment, the 45 conditions that must be satisfied to trigger the firing of rules that generate the higher-level semantic events determine which events are tracked. Features of this aspect could be carried on as illustrated in a patent application, filed concurrently herewith for the same applicant, entitled 50

"Method and System for Transforming Session Data,".

5 The server application 1050 passes the composite site identifier (2b) to a composite site
manager 1070. The composite site manager 1070 embodies features described in a patent
application filed concurrently herewith and incorporated herein by this reference, entitled
10 Composite Site Generation System. In some embodiments, the composite site manager 1070
includes software components configured for generating web pages, e.g., HTML documents, or
15 XML documents with an XSL style sheet for presenting the XML data. The collection of web
pages provided through the composite site manager 1070 to the user of the client system 1010
constitute the composite site. For ease of exposition, a single document or web page forming a
20 portion of the composite site is also referred to herein as the composite site or a composite site
resource.

25 The site is 'composite' in that the web pages themselves comprise component resources
requested from target sites, such as a first peer server 1038 and a second peer server, 1034 that
are assembled by the composite site manager 1070. The assembling of the component resources
is determined by a definition of the composite site. These features are further illustrated below
30 with reference to Fig. 4. Additionally, further related detail can be found in the disclosure of a
concurrently filed patent application entitled "Method and System for Composite Site Resource
Generation" set forth as ANNEX A hereto.

35 The composite site manager 1070 uses the CSID to retrieve (4) the definition of the
composite site from a database 1080. In some embodiments, the definition of the composite site
40 is stored in the database 1080 in conventional relational tables and mapped to an XML schema
upon retrieval (4). The composite site manager 1070 may store the composite site definition in a
cache 1075, thereby reducing database query latency when repeatedly generated the composite
45 site resources.

50 The composite site manager 1070 parses the composite site definition to identify
component resources that should be retrieved to assemble the composite site. The composite site
manger 1070 instructs a client application 1100 to request (6) component resources resident on

remote systems.

Some embodiments of the invention include an interposition mechanism. The interposition mechanism can be used to perform actions on for instance, HTTP, Request and Response messages. The interposition mechanism can produce events relative to the interaction between the platform 1040 and peer server systems (described below). The interposition mechanism further can perform lightweight HTTP flow updating and/or redirection. The interposition mechanism achieves these features by intercepting and modifying, for instance, HTTP Request / Response flow via modules. An interposition engine 1095 operates with and controls the sequence of execution of the modules. Interposition modules perform the actual functional modification of the HTTP flow. In some embodiments, one or more filters are used to determine whether a particular interposition module has to perform an action or not. One skilled in the field will appreciate that such filters can avoid having the modules perform generic manipulation. One or more dispatchers, which are abstract components, handle the filters. Typically a dispatcher is followed by one or more filters, which, in turn, are followed by one or more modules. When a request or response enters the interposition engine 1095, all filters are executed on it to determine which (if any) modules meet the criteria of the filters. Preferably, modules execute only after all filters have executed.

In an illustrative embodiment, one or more first interposition modules 1100 may alter the request (6). In accordance with this embodiment, an interposition module is a software module that examines a locator in the request (6), e.g. a URL, and if a particular pattern is satisfied, the interposition module executes code to perform an action either on the locator itself, or more generally on the state of the platform 1040. For instance, in some embodiments interposition modules could be used to implement a common "shopping basket" or a "common wallet" on an electronic commerce portal. Yet another aspect of the invention are methods using interposition modules to transform data flow in a browsing session. The transformed data flow may be to provide an electronic commerce transaction function in the context of the network-based partner relationship.

In some embodiments, one of the component resources includes a page from a merchant's

on-line catalog. Peer entities may be merchants with such on-line catalog. For instance, a first peer entity may operate a first peer server system 1038 though which the peer entity operates an electronic commerce operation including an on-line catalog of items for which users can make purchase orders. A page forming a portion of this on-line catalog can constitute one of the component resources. Similarly, other component resources could be requested from a second peer server system 1034 operated by a second peer entity distinct from the first peer entity. More generally, the component resources could include any addressable resource capable of being parsed and rendered by the client system 1010.

A response (7) including the component resource requested in the request (6) returns. One or more second interposition modules 1120 may alter the response (7) as the first interposition modules 1110 may alter the request (6). The client application 1100 receives the response (7) which is provided (8) to a reference rewriting module 1030.

The reference rewriting module 1130 rewrites certain resource references in the response (7) to ensure that requests for these resource made by the client system 1010 are directed to the platform 1040. This is described in greater detail below in connection with Fig. 5. Briefly here, references to resources including, for instance, URLs, are rewritten from identifying a resource accessible from a target site such as the first peer server system 1038 to a resource accessible from the platform 1040. This step thus provides a facility for the platform 1040 to track and monitor a browsing session of the client system 1010 as more fully described below.

The reference rewriting module 1130 provides (9a) the component resources (with resource references appropriately rewritten) to the composite site manager 1070 that assembles the component resources in accordance with the definition of the composite site to generate a composite site resource. The composite site manager 1070 provides (10) the resulting resource to the server application that then provides this as a response (11) to the request (1) from the client system 1010.

The server application 1050, the reference rewriter 1130, tracker module 1060 and client application 1100 form a transactional engine 1030 for tracking the browsing session and creating

session-level semantic events. In some embodiments, the transactional engine 1130 is multithreaded with its various components communicating through shared memory. In some 5 embodiments it is implemented in a language such as C for increased efficiency.

During the above-described process events are detected and reported from the data flow. 10 In part, this is described above in connection with the server application 1050 passing events (2a) to the tracker module 1060. In addition, the reference rewriting module 1130 may be configured to detect and report events 9b based on the contents of the component resource when parsing the 15 component resources to detect references for rewriting. For instance, if the component resource were a page from a merchant's on-line catalog that indicated a price for an item that was purchased, the price could be detected and reported as the event 9b. As one skilled in art having 20 the benefit of this disclosure will appreciate, the type and particulars of events 9b detected and reported in this fashion is limited only by the data flow in the browsing session.

One deficiency, however, in the data flow of a client-server request/response cycle is that 25 it is in the semantic of the request/response cycle. Ordinarily this semantic level is too low for purposes of effectively managing network partner relationships. Fundamentally, any fact in a semantic that spans multiple requests/responses cannot be represented by an event drawn from a single request/response cycle. Yet, it is in such higher-level semantics that facts useful for the 30 management of the partnership relationship are desired. The session-level semantic event that a document was received that included a particular number in a particular place in a particular pattern is too low to take meaningful action in a partner relationship, e.g., crediting a commission 35 from a merchant to an affiliate. In a higher-level semantic, the document has the meaning of an order confirmation page and the number is the purchase price. In some embodiments, events in the session-level semantic are extracted from HTTP Request and Response messages; these 40 events are accumulated or aggregated, and higher-level semantic events are derived through a rule-based system where activation of a rule coincides with transformation to the higher-level semantic that can draw on the aggregated or accumulated information.

A mechanism for generating higher-level semantic events from the low session-level 50 semantic events involves the tracker module 1060 providing (3) session-level semantic events

(2a & 9b) to a low level event manager 1140. An method and system for performing this feature
are described in the aforementioned patent application entitled "Method and System for
Transforming Session Data," filed concurrently herewith forming Annex B.

The low level event manager 1140 publishes a sequence of tracked session level semantic
events across a first message broker 1150. In some embodiments the message broker uses Java
Messaging Services, although other systems could be used. A set of higher-level semantic event
generators 1160 subscribe to the first message broker 1150 and generate events in a higher-level
semantic from the events in a session-level semantic. This is describe in greater detail in the
concurrently filed patent application entitled "Method and System for Transforming Session
Data". Note also that an interposition module, such as one of the first interposition modules
1110 may also publish events on the first message broker 1150 either directly as illustrated in
Fig. 1, or by providing them upstream of the message broker 1150 to the low-level event
manager 1140.

The set of higher-level semantic event generators 1160 provide higher-level semantic
events across a second message broker 1155. The second message broker 1155 may be of the
same or different type of messaging service as the first message broker 1150. Also, in some
embodiments the second message broker 1155 publishes across a public network.

Applications for managing aspects of the network partner relationship can subscribe to
the higher-level semantic events provided on the second message broker 1155. In some
embodiments, a compensation management application 1170 subscribes and manages flows of
compensations among the peer entities forming the network partner relationship. In some
embodiments, a statistics generation application 1180 subscribes and generates summary data
and analysis about financial, administrative, or network aspects of the network partner
relationship. More generally, a custom application 1190 can be written to provide particular
services based on the higher-level semantic events.

Still further, in some embodiments the composite site manager 1070 receives higher-level
semantic events from the second message broker 1155 and dynamically alters aspects of

composite site resources based on the higher-level semantic events.

5 **Fig. 2-1, 2-2, and 2-3** depict functions available to various peer entity relationship participants in accordance with an illustrative embodiment. In some embodiments the functions depicted in these figures are accessed through a browser-based interface to the relationship engine 1090 where server-side logic controls generation of the pages implementing the interface 10 on the browser and generates/updates the appropriate data objects in the database 1080 based on 10 browser-user input.

15 **Fig. 2-1** depicts functions available to a peer entity identified as a 'Merchant.' A create offer function 2110 involves creating a definition of a (potential) peer entity relationship ('offer'). Creating an offer involves identifying items covered by the offer 2150. In some 20 embodiments, the items are identified with reference to the on-line catalog of the Merchant although the items covered could be identified in other ways. Creating an offer also involves determining compensation and other terms 2130 for the offer.

25 In some embodiments the compensation terms are rule-based and provide conditions that must be satisfied and the resulting compensation if the conditions are satisfied. For instance, the 30 Merchant may pay a 5% commission if an item is sold. One skilled in the art having the benefit of this disclosure, will readily appreciate that the particular rules determining compensation are not fundamental and may be tailored to the particular circumstances of the peer entities. Further, 35 certain common compensation rules (e.g. commission as a percentage of sales price) could be predetermined and that other compensation rules be custom-developed. In some 40 embodiments, offers include other terms including, for instance, an exclusivity term, a compensation period, a renewal schedule, etc. As with the compensation rules, these could be predetermined and selected among or custom-developed.

45 Creating an offer also involves determining access rights 2140 to information generated in connection with implementation of the offer and privileges for changing aspects the offer. Finally, another aspect of creating an offer is selecting a composite site definition 2120. The 50 composite site definition determines a manner in which component resources from various peers,

e.g., the Merchant, will be assembled during a user's browsing of resources within the scope of the offer.

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Another function available to the merchant is viewing compensation or statistics 2170. After an offer has been accepted (as described below) activity within the scope of the offer may generate compensation flow to or from the Merchant and may generate statistical information. 10 The viewing compensation or statistics 2170 function allows the Merchant to have this information presented.

15

Yet another function available to the Merchant is to accept or decline potential peer entities 2160. In particular, after an offer is created, interested entities may seek to accept the offer (as described below) and thus become peer entities. When such an entity has indicated a desire to accept the offer, the Merchant can either accept or decline. 20

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After an offer has been created, it is made available and interested entities may review it and indicate their desire to accept the offer. Those entities accepting offers are termed "Affiliates". As depicted in Fig. 2-2, functions available to an Affiliate include an accept offer function 2100. The accept offer function 2100 may also be accessed with a browser-based interface to server-side logic as described above in connection with the Merchant functions. In addition, the Affiliate defines the composite site 2110 that will be used with the offer. Using the definition of the composite site selected by the Merchant, the Affiliate specifies their component resources that will be used in presenting the composite site during the user's browsing session. 30 35 As with the Merchant, the Affiliate may view compensation or statistics.

35

A third type of entity in addition to Merchant and Affiliate is termed an "Executive." The Executive has functions available to it in addition to those of the Merchant. In particular, the Executive identifies a currency 2135 that will be used for offers implemented by the platform. Finally, the Executive may accept or decline Merchants 2180 that may desire to create offers. 40 45

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Fig. 3 depicts a state diagram illustrating a composite site browsing session 3000 in accordance with an illustrative embodiment in which a user operates a conventional web browser. Initially the user in an internet browsing state 3100 follows a link to a peer site 3150 50

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and enters a peer browsing state 3200. While in the peer browsing state 3200, for instance navigating a site of an Affiliate, the user follows link to a composite site 3250. More particularly, the link to a composite site 3250 is a URL of the form:

<protocol>://<path to platform>/<field1>/<field value1> . . . <fieldN>/<field valueN>/<id. of target resource>.

The portion <id. of target resource> is an identifier of a resource that will be included in the composite site resource provided to the user when a request is made for the resource associated with the link to a composite site 3250. In some embodiments the identifier is a URL; in others a key used in a lookup data structure, and, in any event, the particular form is not fundamental. The link to a composite site 3250 is associated with a particular offer and is provided to the Affiliate in connection with offer creation/acceptance interaction previously described. That is, when a Merchant has agreed to an Affiliates' acceptance of an offer the link to a composite site 3250 is provided to the Affiliate to place on the Affiliate's site. Thereafter, when a user follows this link, their session is tracked through the platform 1040.

Now in a composite site browsing state 3300, the resources provided to the user's client system have two features. First, when following a link to request a resource, the response sent to the user's browser is an composition of component resources (as is further described below in connection with Fig. 4) including resources from the Merchant peer entity and the Affiliate peer entity. Second, links in the component resources (with a few exceptions described below) are rewritten to point to a server system hosting the platform 1040 creating the composite site. For instance, one of the component resources in a composite site page could be a page from an on-line catalog of the Merchant. This page could initially have a link that points to a different page in the Merchant's on-line catalog. This link is rewritten to point to the platform 1040 and to include an identifier of the different page.

One skilled in the art will appreciate that while following links provided as part of the composite site, the user's browsing session consists of requests sent to the platform 1040. As for the exceptions noted above: first, certain links may not be rewritten ("forwarded links"), for instance those which point to resources provided by others than the Merchant and Affiliate;

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second, it should be noted that URLs for resources which themselves could not include links, e.g., an image file, need not be rewritten to maintain the above-described functionality. Thus, 5 from the composite site browsing state 3300, the user's browsing session returns to the composite site browsing state 3300 when following non-forwarded links 3350 and leaves the composite site browsing state 3300 when following a forwarded link 3400.

10 **Fig. 4** depicts schematic of a composite site page 4000 as it could be parsed and rendered on a user's browser in accordance with an illustrative embodiment. The composite site page 4000 includes a page from a first peer's on-line catalog 4100 and a first banner 4400 from the 15 first peer. The composite site page 4000 also includes a second banner 4300 from a second peer. In some embodiments, the first peer is a Merchant and the second peer an Affiliate. The 20 composite site page 4000 also includes an offer-related document 4200 that may be created in connection creation of the offer and a sales logo 4500 indicating, for instance, a special sale or promotion.

25 One skilled in the art having the benefit of this disclosure will readily appreciate that possible layout of the composite site page 4000 is, in no way limited, to the specific layout shown in **Fig. 4**. Rather, one skilled in the art will now readily apprehend that many others could 30 be made, and apprehend how to make them. Further, the layout of the composite site page 4000 need not be static and could change from request to request.

35 **Fig. 5** depicts a block diagram of a reference rewriting module (such as the reference 40 rewriter 1130) in accordance with an illustrative embodiment. The reference rewriting module rewrites resource references that point to target resources to references that point to platform resources.

45 Initially when the platform 1040 receives a request for platform resource 5100 it is passed to a parsing module 5200 that disassembles the reference and extracts an identifier of a target 50 resource. Next a request for the target resource 5300 is sent and a response 5400 received including the target resource. In illustrative embodiments of the invention, the HTTP protocol is used and resources identified with URLs.

A URL extraction module 5500 parses the response 5400 to identify URLs that should be rewritten. One skilled in the art will appreciate that there are several levels of generality in which URLs can be detected and rewritten/substituted. As an initial matter, the response 5400 could be an ASCII file, a binary file, or a combination. The contents could be in a particular language, e.g., HTML, Java/ECMA Script, or a structured document such as a MACROMEDIA FLASH file, XML file, or PDF file. Still further, the response 5400 could be an unstructured document. In some embodiments, there are plural URL extraction modules 5500 and each is associated with a particular language and handles documents in that language.

For structured documents, preferably the structure is known, and, if the size of the document is stored as part of the document, this may be extracted as well and rewritten to accommodate changes to the size of the document on account of rewriting URLs. For unstructured documents, parsing may not be possible and pattern matching may be used.

The URL extraction module 5500 need not extract each URL for rewriting and in some embodiments, URLs that identify documents which themselves do not contain any selectable links, e.g., images, sound files, video clips, are left unaltered.

For URLs that should be replaced, a set of replacement rules 5600 define how the replacement should be affected. The replacement rules 5600 should be suitably chosen to effectively replace the URLs without introducing errors into the expected behavior of the user's client system when presenting the altered document. For documents in a particular language, the replacement could be language specific. In HTML, for instance, simply placing the original URL in the data portion of the path of a new URL that references a resource on the platform 1040 could be sufficient. In JavaScript, where the URL could be generated at the client-side after rendering, the replacement rule may rewrite functions generating such URLs to be wrapped inside another function that calls the original function, receives the result, and handles the result as described above for HTML.

For structured or semi-structured documents, URLs may be substituted as described above for an HMTL document, however care should be taken to maintain any internal

5 consistency in the document. For instance, a size field should typically be increased to account
for the increased length of the substituted URLs. As noted above, for unstructured documents,
search/replace with pattern matching could be used.

10 Based on the replacement rules 5600 a replacement reference is determined and a URL
replacement module 5700 replaces the original reference with the replacement reference. One of
skill in the art will appreciate that, with decreased generality, other cases of reference
replacement can be handled. For instance, client-side state objects (commonly known as
15 "cookies") can be replaced so that an original cookie set by a target site is wrapped in a cookie
set by the platform. On subsequent requests to the platform, this cookie will be sent, the target
cookie extracted and forwarded along with the request for a target resource.

20 Another example is secure sockets layer (SSL) sessions. For SSL sessions, the platform
initiates an SSL connection with the user's client system as a server and another SSL with the
target system as a client; i.e. the platform acts a 'man-in-the-middle' observer. The platform then
25 receives encrypted requests from the client system, decrypts the requests, and submits a suitably
rencrypted request to the target system. The response from the target system is decrypted,
references are replaced as described above, and then reencrypted and returned as a response to the
30 client. As one of skill in the art will appreciate, the platform should obtain suitable certificates
for carrying on in this manner.

35 Although the present invention has been described in terms of features illustrative
embodiments, one skilled in the art will understand that various modifications and alterations
may be made without departing from the scope of the invention. Accordingly, the scope of the
40 invention is not to be limited to the particular embodiments discussed herein, but should be
defined only by the allowed claims and equivalents thereof.

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Claims

What is claimed is:

1. A computer-controlled method of operating a network-based partner relationship, said computer-controlled method comprising:
 - 10 establishing a representation of a relationship between a first peer entity and a second peer entity, said representation comprising: a collection of resources associated with said relationship, a presentation representation to be applied when providing ones of said collection of resources, and criteria for providing a compensation flow between said first peer entity and said second peer entity;
 - 20 dynamically generating composite resources during a browsing session, said composite resources comprising a first component selected from said collection of resources and associated with said first peer entity, and a second component selected from said collection of resources and associated with said second peer entity;
 - 25 monitoring said browsing session for generating session events;
 - 30 transforming said session events to events in a semantic associated with said relationship, generating higher-level semantic events;
 - 35 generating a compensation flow responsive to said higher-level semantic events based on said criteria.
- 40 2. The computer-controlled method according to claim 1 wherein:
 - 45 generating session events further comprises providing said session events on a first message broker; and
 - wherein transforming session events comprises:
 - 50 receiving said session events from said message broker; and
 - providing said higher-level semantic events on a second message broker.

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3. The computer-controlled method according to claim 2 wherein dynamically generating composite resources during a browsing session comprises:
10 receiving said higher-level semantic events from said second message broker; and selecting one of said first component and said second component responsive to said
15 higher-level semantic events.

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4. The computer-controlled method according to any preceding claim wherein dynamically generating composite resources during a browsing session comprises:
25 initiating a request for said first component, said request directed to a first target site;
receiving said request;
30 altering said request, forming an altered request; and
forwarding said altered request to said first target site.

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5. The computer-controlled method according to any preceding claim wherein dynamically generating composite resources during a browsing session comprises:
40 initiating a request for said first component, said request directed to a first target site;
receiving a response from said first target site;
45 altering said response forming an altered response;
forwarding said altered response; and
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receiving said altered response.

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6. The computer-controlled method according to claim 4 further comprising:
 - 10 initiating a request for said first component, said request directed to a first target site;
 - 15 receiving said request;
 - extracting information from said request;
 - 20 altering a state of a state object responsive to said information extracted from said request.
- 25 7. The computer-controlled method according to claim 6 said state object comprises contents of a common shopping basket.
- 30 8. The computer-controlled method according to claim 6 wherein said state object comprises a representation of value stored of a common wallet.
- 35 9. A computer-controlled network-based partnership system comprising:
 - 40 a relationship engine for defining attributes of a relationship among peer entities comprising a first peer entity and a second peer entity;
 - 45 a storage for storing said attributes of said relationship;
 - a composite site manager for dynamically generating composite resources during browsing sessions, said composite resources comprising component resources

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5 associated with said first and second peer entities, said composite site manager
configured for retrieving a characterization of said composite resources from said
storage;

10 a session tracking component, said session tracking component comprising:

a server application configured for receiving requests from a client system,

15 a communication client configured for requesting said composite resources
from said composite site manager,

20 a client application configured to request said component resources from server
systems associated with said first and second peer entities; and

25 a session event generation module configured for generating event data
respecting said requests and said component resources;

30 a set of semantic mapping modules, said semantic mapping modules configured for
receiving , said semantic mapping modules comprising rules for generating higher-
level semantic events responsive to said event data.

35 10. The system according to claim 9 further comprising:

40 a message broker, said message broker configured for receiving said higher-level
semantic events from said set of semantic mapping modules; and

45 wherein said composite site manager is further configured for receiving said higher
level semantic events from said message broker, and wherein said composite site
manager dynamically generates said composite resources responsive to said higher-
level semantic events.

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- 5 11. The system according to claim 9 or claim 10 further comprising:
an interposition module, disposed between said client application and said server
10 systems, said interposition module configured for altering said request sent by said
client application for said component resources.
- 15 12. The system according to claim 9 or claim 10 further comprising:
an interposition module, disposed between said client application and said server
20 systems, said interposition module configured for altering said component resources
sent by said server systems.
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ABSTRACT OF THE DISCLOSURE5 A METHOD AND SYSTEM FOR MANAGING NETWORK-BASED
PARTNER RELATIONSHIPS

10 Disclosed are computer-implemented systems and methods for the management and operation of network-based partner, e.g., business, relationships. A representation of the 15 partner relationship is established that includes rules for allocation of compensation, the subject matter to come under the partner relationship, and a resources to be presented to users/customers when they encounter an aspect of the partner relationship, for instance by 20 browsing a web site of one of the partner entities. A system implementing the partner relationship includes a transactional engine for monitoring the browsing activity of a user while browsing partner relationship resources. A composite site manager generates the 25 partner relationship resources based on component resources drawn from the partner entities and a presentation characterization forming part of the relationship representation. The transactional engine generates event data from the client-server request/response data flow. 30 Message brokers transport the event data to software component that accumulates and aggregates the event data to generate facts that are meaningful for the operation of the partner 35 relationship, e.g., compensation flows. An interposition mechanism allows for the request/response data flow to be modified. Further, the interposition mechanism can be used to implement common wallet or common shopping basket functionality in the context of the 40 partner relationship.

45 Fig 1

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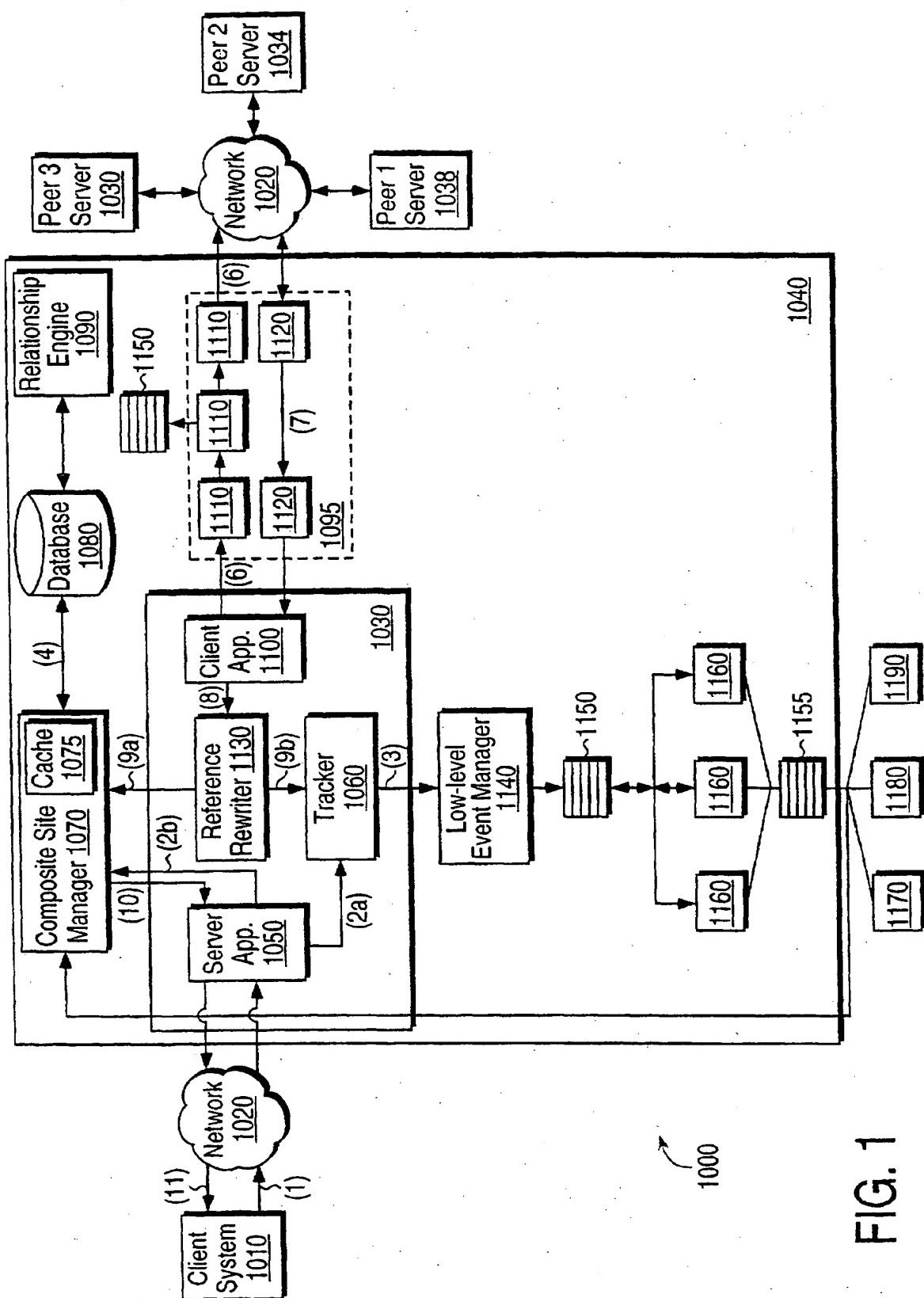
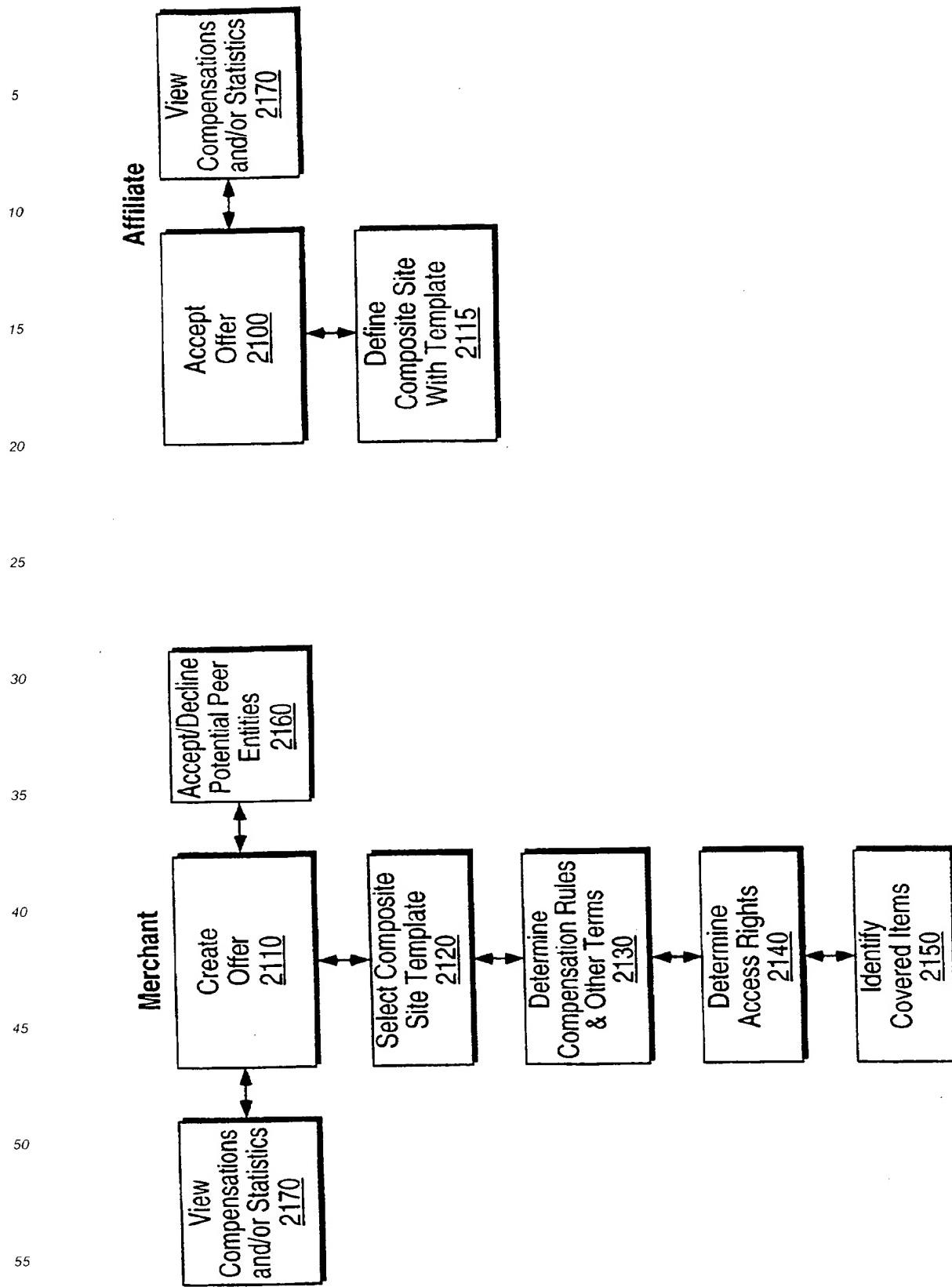


FIG. 1



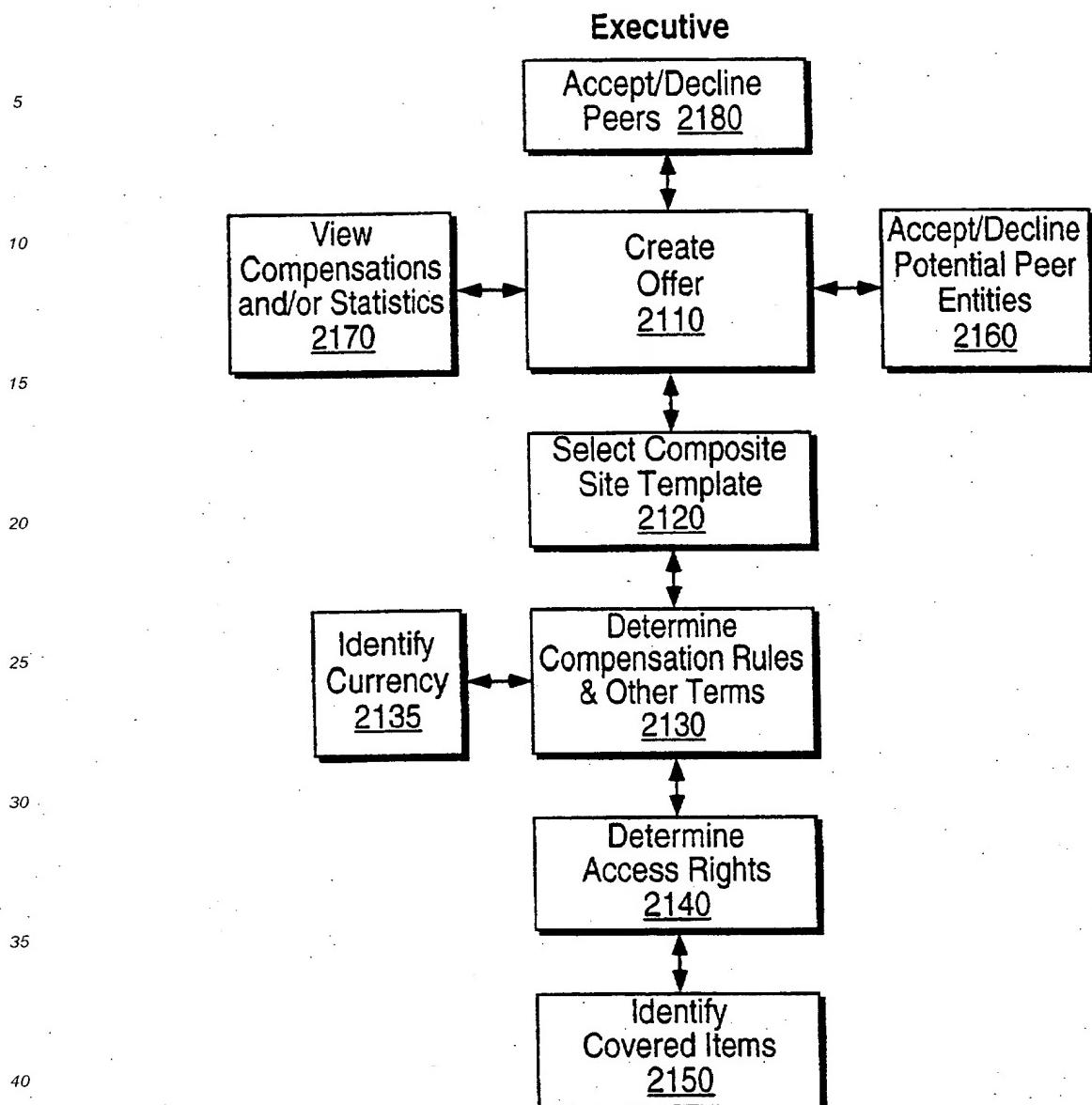
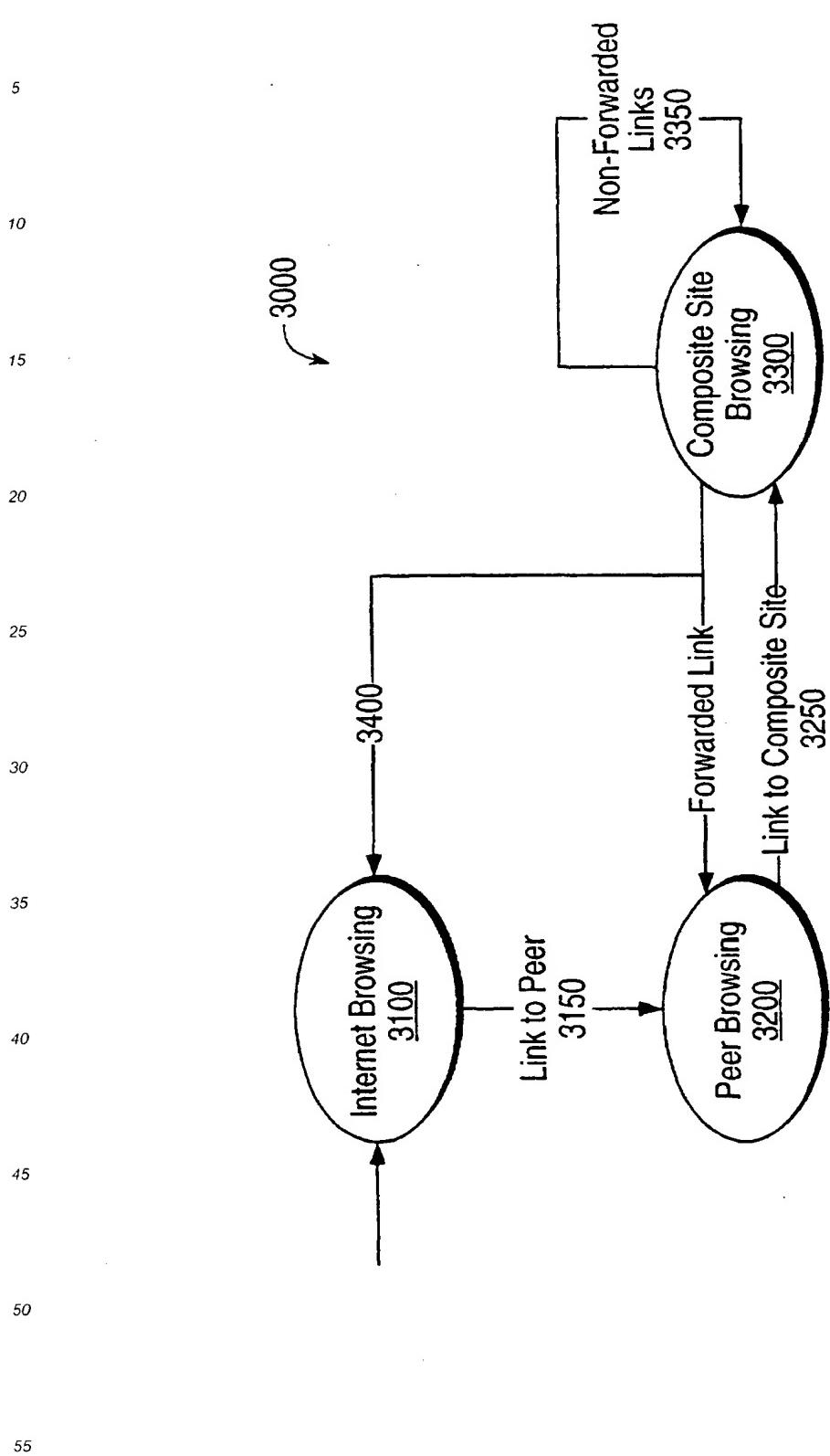


FIG. 2-3

FIG. 3



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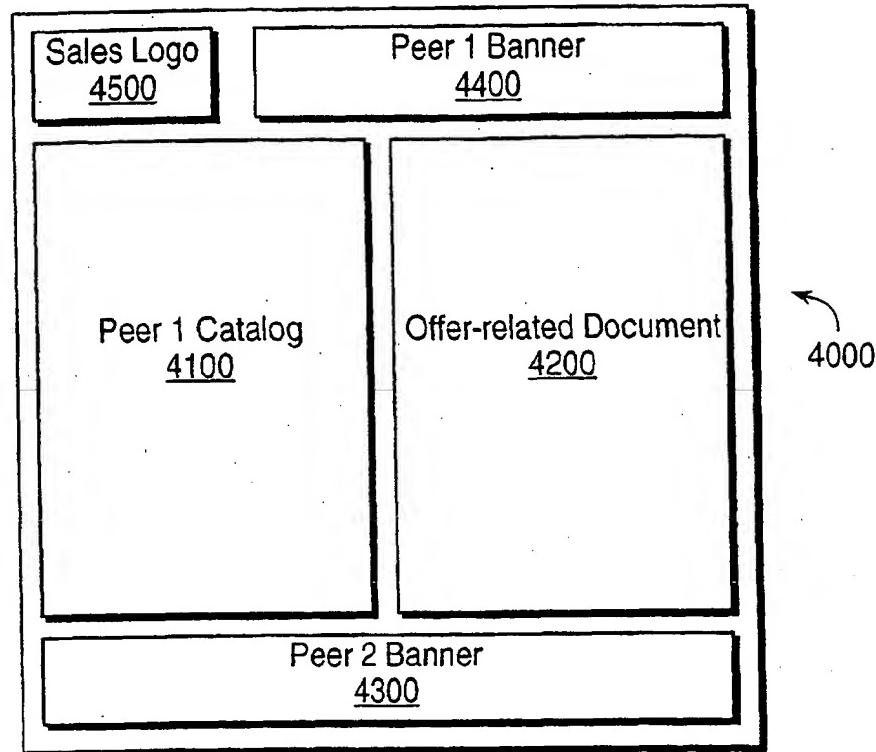


FIG. 4

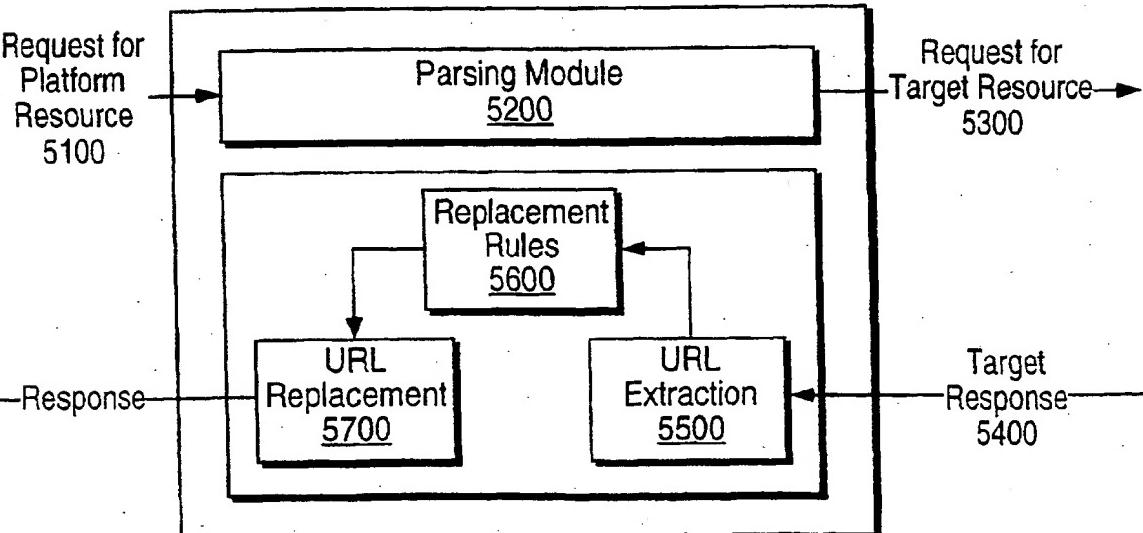


FIG. 5

Claims

1. A computer-controlled method of constructing a composite site resource, said computer-controlled method comprising:
 - 5 receiving an identifier of a composite site;
 - retrieving a characterization of said composite site resource responsive to said identifier, said characterization comprising a set identifiers for a set of component resources;
 - 10 communicating requests to retrieve said set of component resources based on said set of identifiers;
 - receiving said set of component resources;
 - 15 assembling said component resources in accordance with said characterization for creating said composite site resource; and
 - returning said composite site resource.
- 20 2. The computer-controlled method according to claim 1 wherein assembling said resource comprises assembling a frameset, said component resources comprise identifiers of resources of frames of said frameset, and said method further comprises:
 - receiving requests said resources of frames of said frameset;
 - 25 retrieving said resources of frames of said frameset; and
 - returning said resources of frames of said frameset.
- 30 3. The computer-controlled method according to claim 1 or claim 2 wherein retrieving a characterization of said composite site resource comprises:
 - submitting a query to a relational database for said characterization; and
 - transforming results from said query from a relational data model to an XML schema.
- 35 4. The computer-controlled method according to any of claims 1 to 3 wherein said characterization of said composite site resource is static.
5. The computer-controlled method according to claim 4 wherein said characterization of said composite site resource is associated with a relationship between a first peer entity and a second peer entity; said characterization of said composite site resource is predetermined by one of said first peer entity and said second peer entity, and providing requests for said component resources comprises:
 - 45 providing a first request for a first component resource to a first sever system associated with said first peer entity; and
 - providing a second request for a second component resource to a second sever system associated with said second peer entity.
- 50 6. A computer-controlled method constructing a composite site resource, said computer-controlled method comprising:
 - receiving a request for a composite site resource, said request comprising an identifier of a composite site;
 - requesting a characterization said composite site associated with said identifier;
 - 55 receiving identifiers of component resources of said composite site resource ;

requesting said component resources based upon said identifiers;

receiving and returning said component resources;

5 receiving said composite site resource; and

providing said composite site resource.

- 10 7. A computer-controlled method constructing a composite site resource, said computer-controlled method comprising:

receiving a request for a composite site resource from a first client system, said request received with a first server application, said request comprising an identifier of a composite site;

15 extracting said identifier of said composite site from said request, by said first server application;

communicating a message comprising said identifier of said composite site to a second server application for requesting said composite site comprising said resource;

20 retrieving a characterization of said composite site, said characterization retrieved by said second server application responsive to said identifier of said composite site;

retrieving a characterization of said composite site, said characterization retrieved by said second server application responsive to said identifier of said composite site;

25 identifying component resources from said characterization of said composite site,

providing to a second client identifiers of said component resources;

30 requesting said component resources, by said second client, and returning said component resources to said second server application;

assembling said component resources in accordance with said characterization of said composite site for creating said composite site resource;

35 returning said composite site resource to said first server application; and

returning said composite site resource to said first client system.

- 40 8. A computer-implemented system for constructing a composite site resource comprising:

a first server application, said first server application configured for receiving a request comprising an identifier of composite site, extracting said identifier, and providing a request for said composite site resource;

45 a composite site generation application, said composite site generation application configured for receiving said request for said composite site resource from, retrieving a characterization of said composite site based on said request, and providing requests for components of said composite site resource;

50 a first client application, said first client application configured for receiving said requests for components, said client application configured for retrieving said components and providing said components to said composite site generation application;

wherein, said composite site generation application assembles said components into said composite site resources in accordance with said characterization.

- 55 9. The system according to claim 8 further wherein:

said composite site generation application comprises:

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a composite site object for representing a definition of the composite site;
a page object for defining a representation of the composite site; and
a layout object for providing an association between said components.

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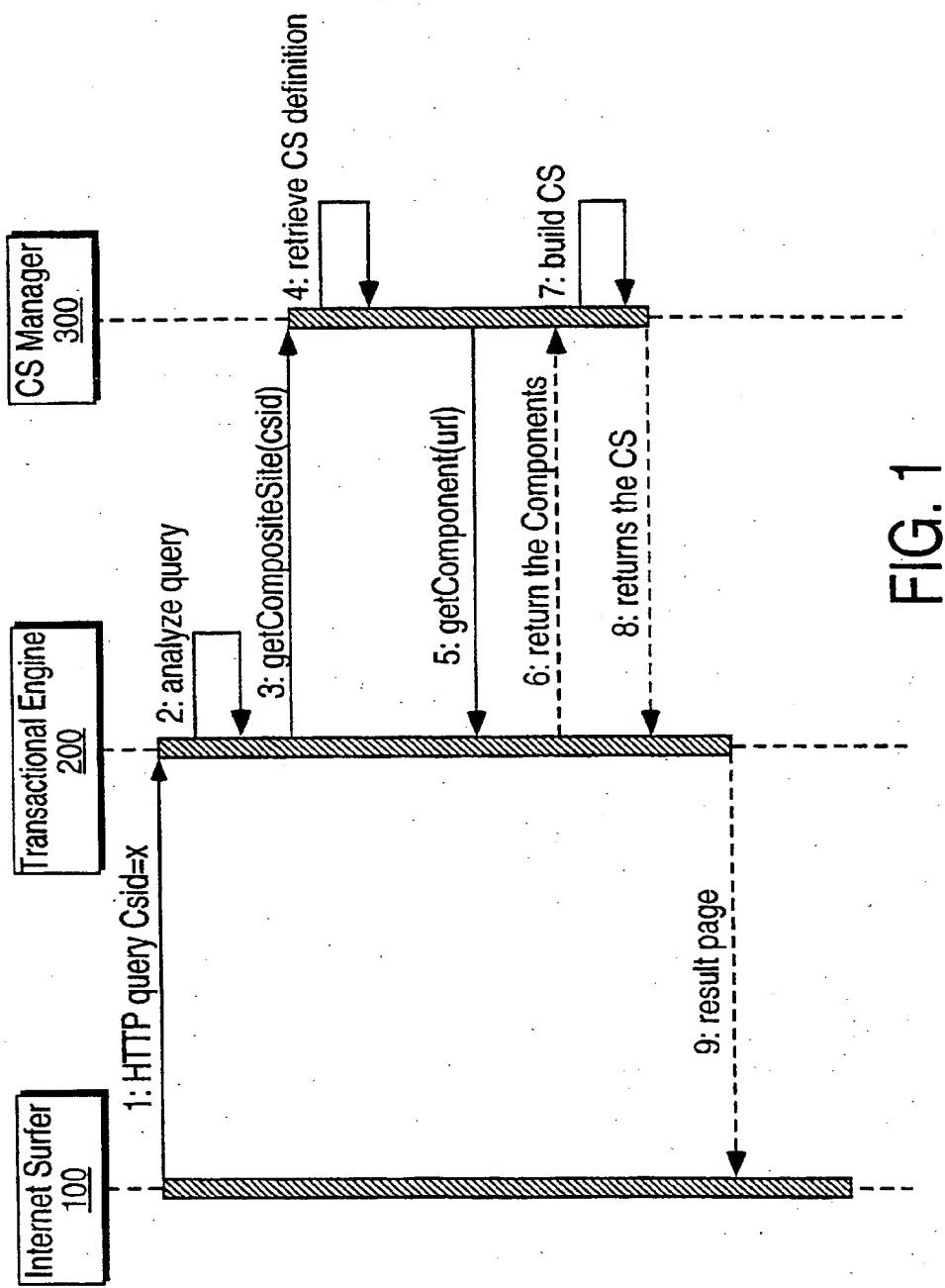
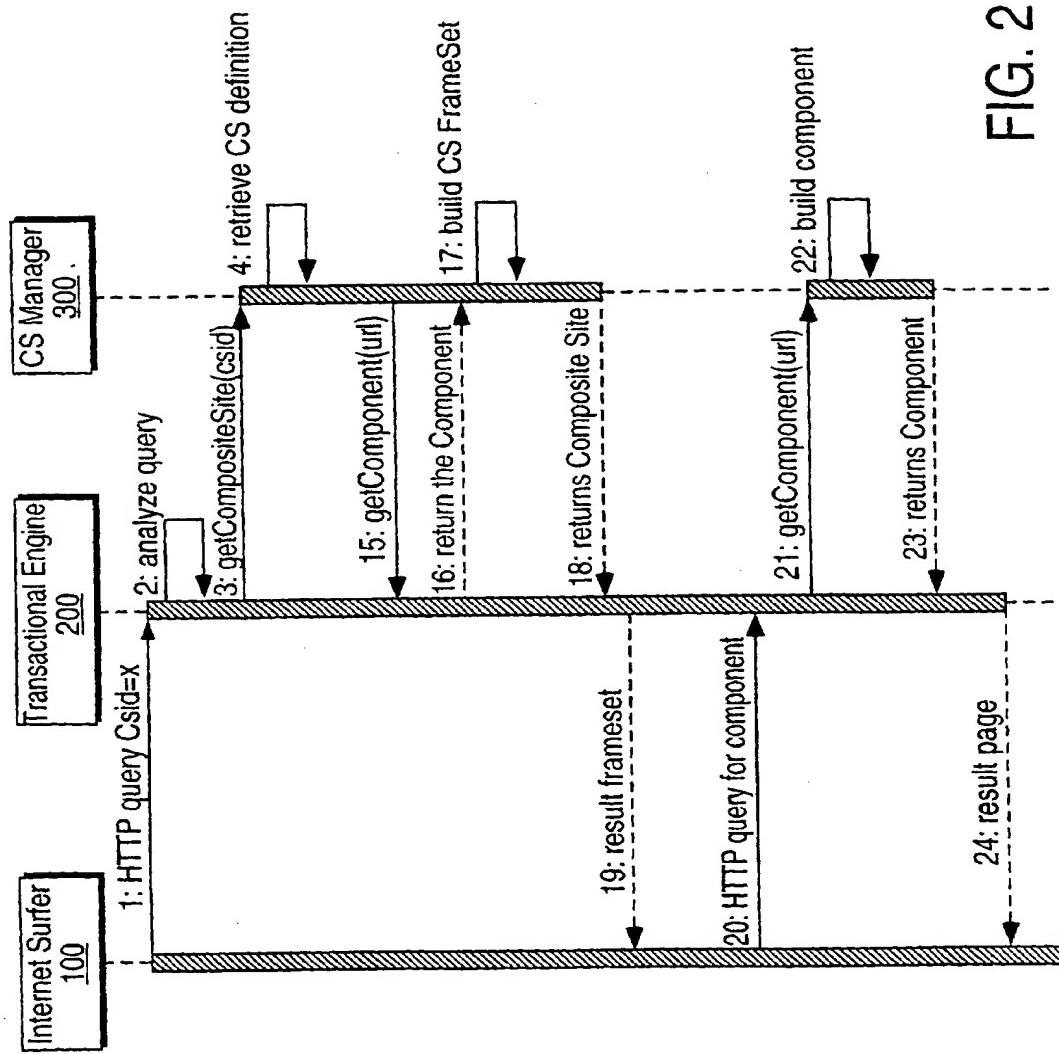


FIG. 1



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        <TR>
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          </TD> 3100
        </TR>
        <TR>
          <TD>
            ? (Document_1)
          <TD> 3200
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    </BODY>
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FIG. 3-1

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FIG. 3-2

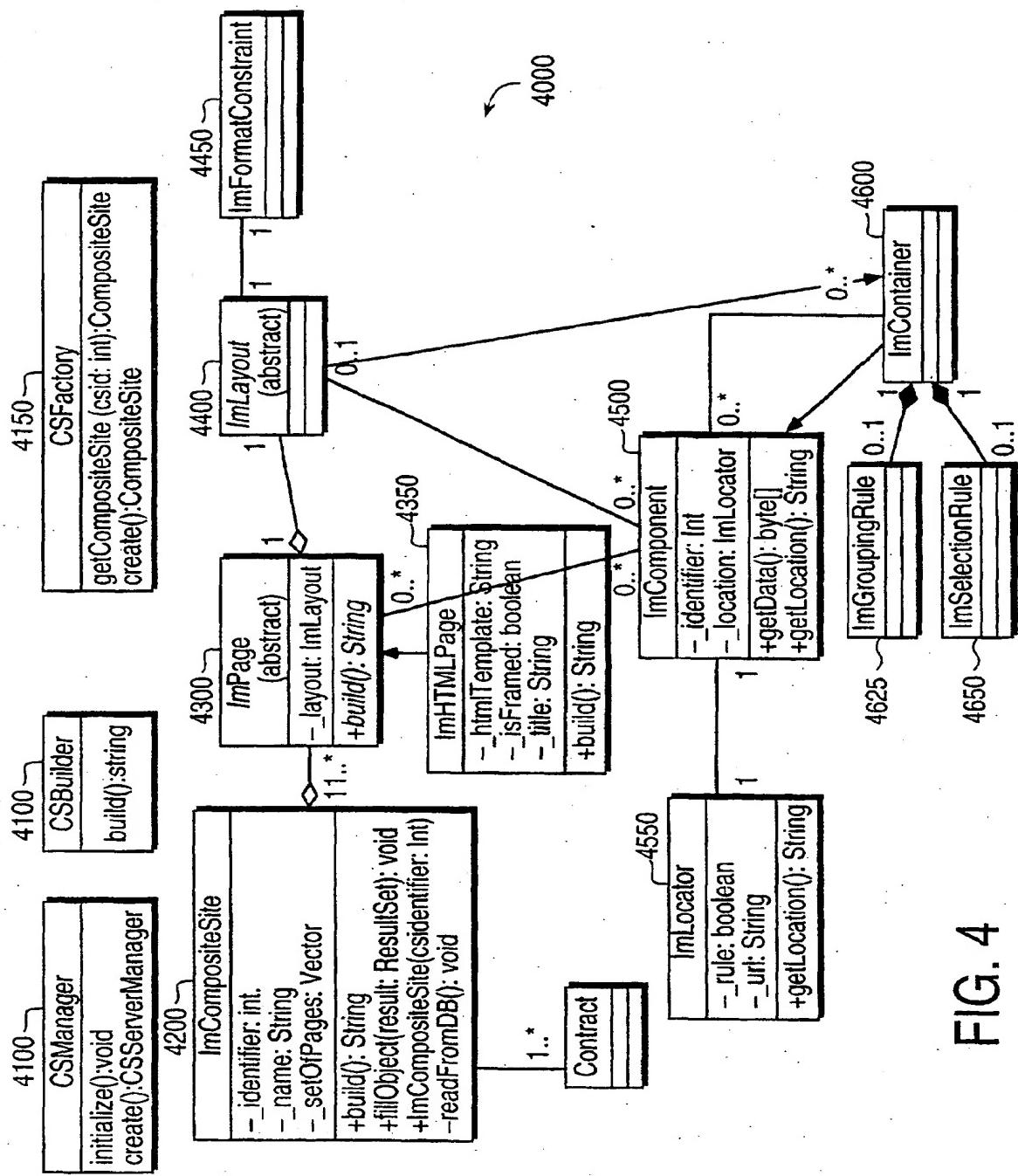


FIG. 4

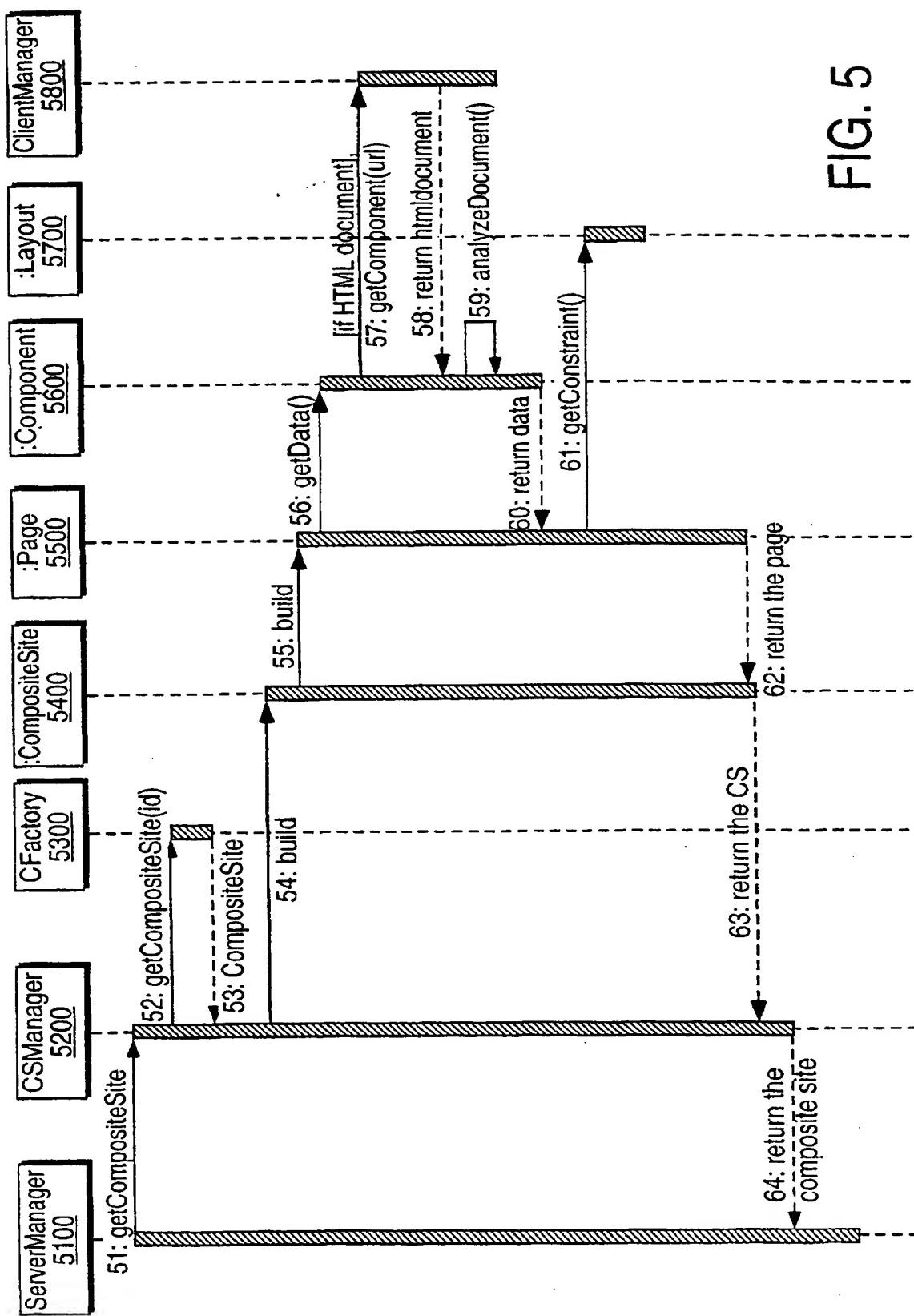


FIG. 5

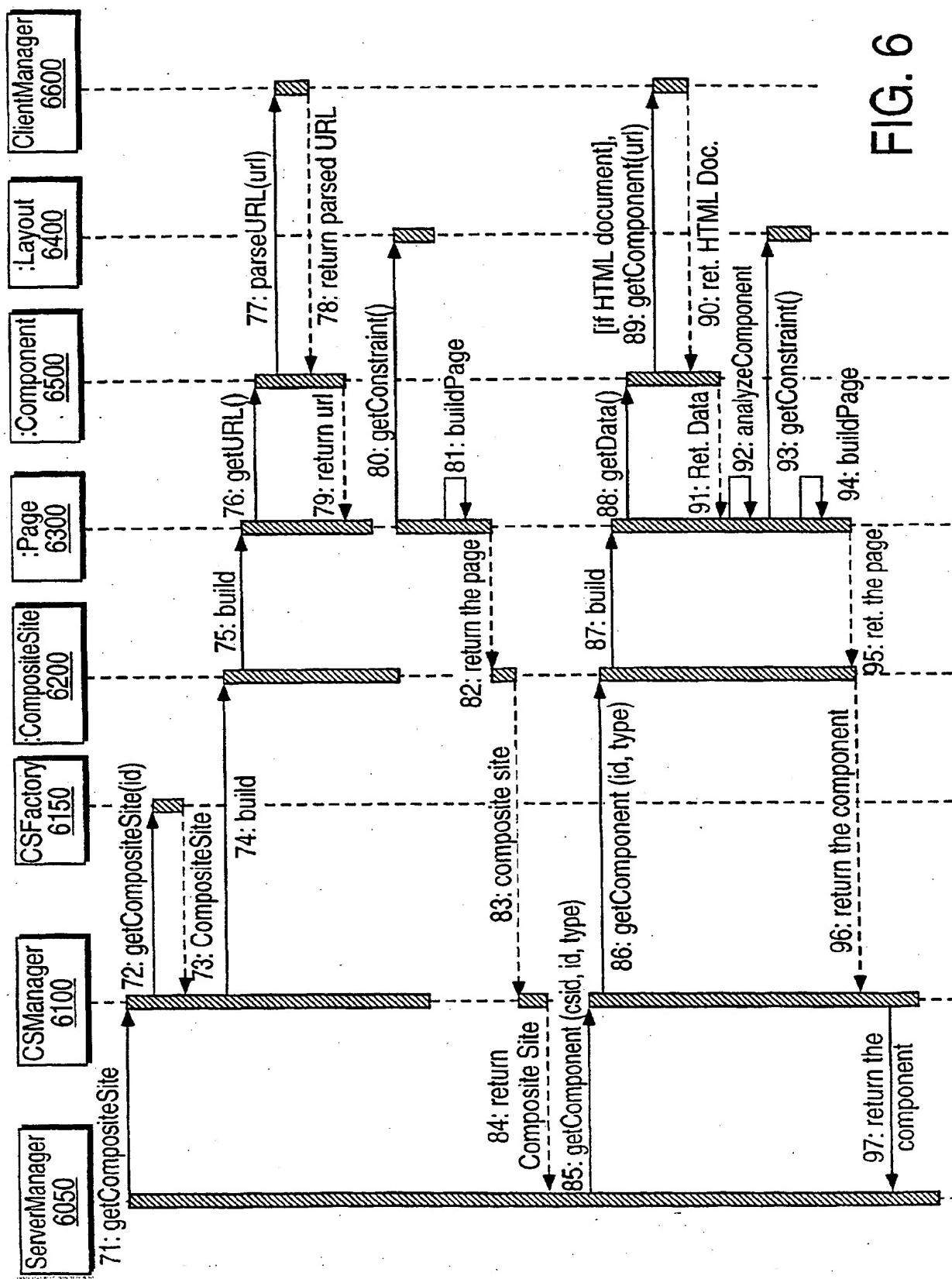
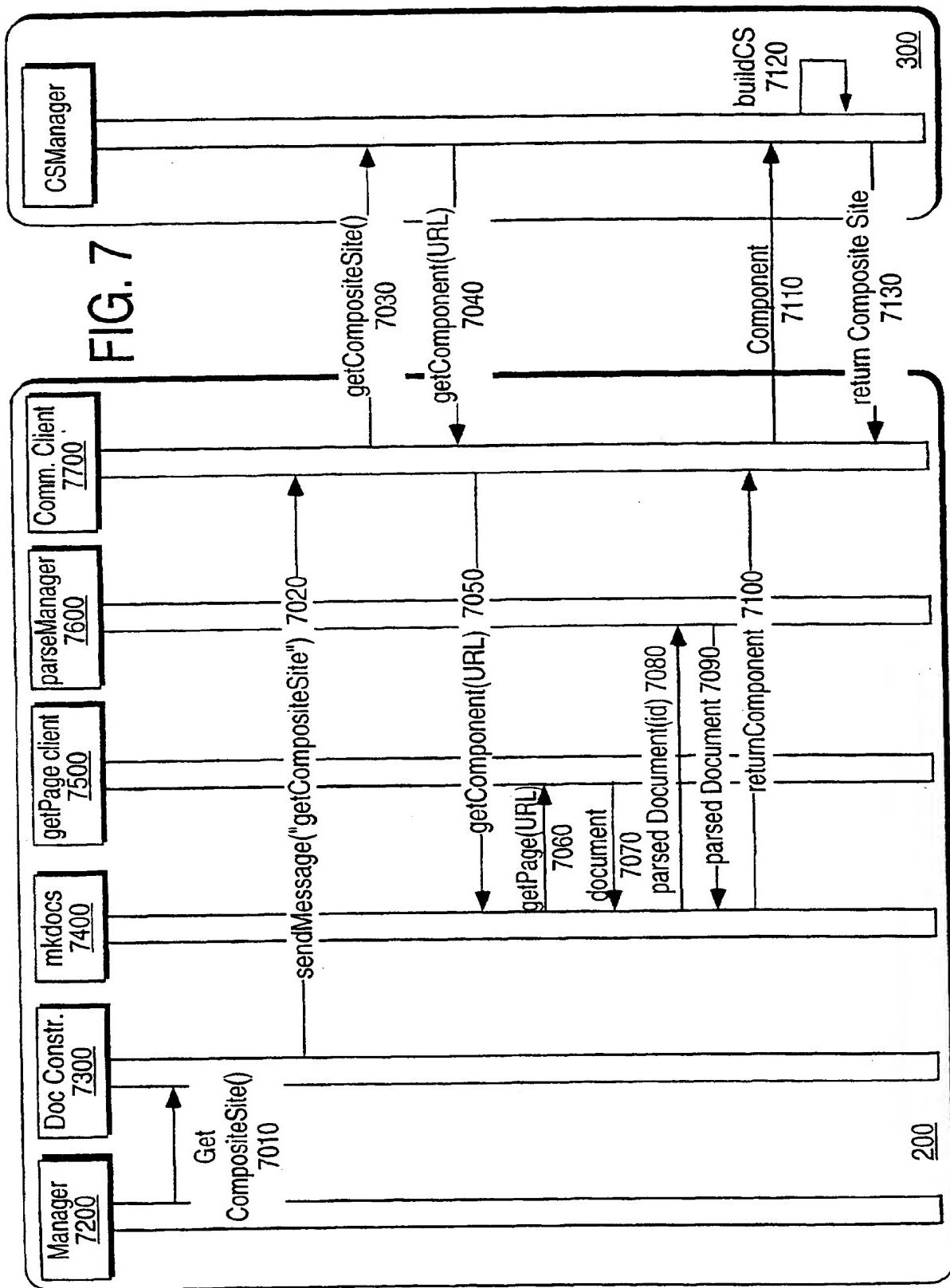


FIG. 6

FIG. 7





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 00 40 2520

DOCUMENTS CONSIDERED TO BE RELEVANT		Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Category	Citation of document with indication, where appropriate, of relevant passages		
X	SHAO W ET AL: "AGENT ARCHITECTURE FOR SUPPORTING INDIVIDUALIZED SERVICES IN INTERNET APPLICATIONS" TAIPEI, NOV. 10 - 12, 1998, LOS ALAMITOS, CA: IEEE COMPUTER SOC, US, 1998, pages 140-147, XP000887516 ISBN: 0-7803-5215-7 * abstract * * page 142, paragraph 3.1 - page 145, paragraph 4.1 *	1-4,6	G06F17/21 G06F17/30 G06F17/22 G06F17/24
A	WO 99 08182 A (LUTRIS TECHNOLOGIES INC) 18 February 1999 (1999-02-18) * abstract * * page 3, line 27 - page 4, last line * * page 6, line 30 - page 7, line 5 * * figure 5 *	1-3,6-9	
A	US 5 715 453 A (STEWART GORDON GREGORY) 3 February 1998 (1998-02-03) * abstract * * column 2, line 7 - line 25 * * column 6, line 50 - column 7, line 16 * * column 8, line 45 - column 9, line 9 * * figures 5,6 *	1-3,6-9	
A	US 5 894 554 A (HOWELL RONALD L ET AL) 13 April 1999 (1999-04-13) * abstract * * column 2, line 15 - line 38 * * column 5, line 7 - column 6, line 49 * * column 8, line 39 - line 51 * * figures 4,5 *	1-3,6-9	
A	US 5 897 622 A (COHEN MICHAEL ARI ET AL) 27 April 1999 (1999-04-27) * abstract * * column 7, line 5 - column 12, line 6 *	1-4,6-9	
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	23 March 2001	Nicoli, F	
CATEGORY OF CITED DOCUMENTS			
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A : technological background		D : document cited in the application	
O : non-written disclosure		C : document cited for other reasons	
P : intermediate document		B : member of the same patent family, corresponding document	

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 40 2520

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23-03-2001

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US 5897622	A	27-04-1999		NONE		

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